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TM 5-4610-218-34

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

WATER PURIFICATION UNIT, VAN TYPE BODY MOUNTED ELECTRIC MOTOR DRIVEN, AC, DC, 115, 208 V, SINGLE AND 3 PHASE, 60 HERTZ, 1/20 TO 2 HP; 1500 GPH, MODEL EMC-1500S NSN 4610-01-037-8746 EMC INDUSTRIES INC. DAAKO1-76-C-5661

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 August 1979

BEST best copy available

WARNING

Be certain that the main power supply lines are disconnected before performing any maintenance functions involving electrical wiring.

When replacing the water purification unit van body, be sure to use a crane with a capacity of at least 12 tons.

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

Technical Manual

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**Water Purification Unit, Van Type Body Mounted
Electric Motor Driven, AC, DC, 115, 208 V, Single and
3 Phase, 60 Hertz, 1/20 to 2 HP; 1500 GPH
(EMC Industries Model 1500S)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U. S. Army Troop Support & Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished directly to you.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. The following instructions are for the use of direct and general support maintenance personnel. They contain information that is beyond the scope of operator and organizational maintenance personnel.

b. Appendix A contains References and Appendix B contains an Expendable Supplies and Materials List.

1-2. Maintenance Forms and Records. Equipment maintenance forms and procedures for their use are contained in TM 38-750, The Army Maintenance Management System (TAMMS).

1-3. Quality Assurance/Quality Control (QA/QC). Information pertaining to this requirement is contained in MIL-W-52482C, Water Purification Unit, Electric-Motor-Driven, Erdlator-Type Clarifier, Diatomite-Type Filter, Van-Body-Mounted, 1,500 GPH.

1-4. Calibration Procedures. Calibration procedures for the Chemical Solution Feeder and the Flow Controller are described in paragraph 5-4 and 6-2 of this publication.

1-5. Reporting of Equipment Improvement Recommendations (EIR). EIR's will be prepared on SF 368, Quality Deficiency Report. Instructions for preparing EIR's are provided in TM 38-750. EIRs should be mailed directly to: Commander, U.S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MEM, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished directly to you.

1-6. Destruction of Army Material to Prevent Enemy Use.

a. General. When capture of the water purification unit by an enemy or abandonment of it to the enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the vital parts of the water purification unit and all corresponding repair parts.

b. Demolition to Render Equipment Inoperative.

(1) Mechanical means. Use sledge hammers, crowbars, picks, axes, or other heavy tools which may be available, together with the tools normally included with the water purification unit to demolish the following vital parts in the order of priority listed. Completion of the first five steps will render the unit inoperative. Completion of the additional steps listed will completely destroy the equipment.

(a) Erdlator tank and filters.

(b) Instruments, controls, and valves.

(c) Truck and generator engine and accessories.

(d) Puncture the fuel tanks.

(e) Slash the tires, hoses, and fabric tanks.

NOTE

The above steps are the minimum requirement for this method.

(f) Pumps and electrical motors.

(g) Wiring and piping.

(h) Filter heads and filter elements.

(i) Chemical feed equipment.

(j) Cut all accessible cables, fuel, hydraulic, and coolant lines.

(k) Chemical containers.

(l) Van body.

(2) Misuse. Perform the steps listed below to make the unit inoperative.

(a) Drain the lubricant and coolant from the engine.

(b) Put sand, pulverized limestone, or ferric chloride into the truck engine and gasoline driven pump engines.

(c) Start the engine and operate at full throttle.

(d) Start the water purification electric motors and jam the mechanism so that the motors will burn out.

(e) Drop small gravel, nuts, or metal scraps into the suction side of the pumps and operate them.

c. Demolition by Explosives or Weapons Fire.

(1) Explosives. Place as many of the following charges (fig. 1-1) as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator. Listed below are the vital parts in order of priority of demolition. Completion of the first four steps will render the unit inoperative. Completion of the additional stepps will completely destroy the equipment.

(a) One 1/2-pound (.227 kg) charge inside the slurry feeder assembly.

(b) One 1/2-pound (.227 kg) charge between the filter pump and motor assembly.

(c) Two 1/2-pound (.227 kg) charges in the diatomite filter. Remove one filter element to place this charge.

(d) Two 1/2-pound (.227 kg) charges in the erdlator tank.

NOTE

The above charges are the minimum requirements for this method.

(e) One 1/2-pound (.227 kg) charge above the chemical solution feeder.

(f) One 1/2-pound (.227 kg) charge below the erdlator agitator drive motor.

(g) One 1/2-pound (.227 kg) charge inside the electrical control cabinet.

(h) One 1/2-pound (.227 kg) charge below the erdlator agitator speed reducer.

(i) One 1/2-pound (.227 kg) charge in the personnel heater.

(2) Weapons fire. Fire on the unit with the heaviest weapons available. Direct fire at the pumps, erdlator assembly, and diatomite filter.

d. Other Demolition Methods.

(1) Scattering and concealment. Remove all easily accessible vital parts such as engine accessories, electrical control cabinet parts, hoses, fittings, filter elements, and tools. Scatter these parts through dense foliage, bury them in dirt or sand, or throw them into a lake, stream, or other body of water. Bags of chemicals should be broken and contents scattered on the ground or in a body of water.

(2) Burning. Pack the fabric tanks, covers, and hose around the water purification unit. Saturate this packing with gasoline, oil, or diesel fuel and ignite it.

(3) Submersion. Totally submerge the unit in a body of water to afford some water damage and concealment. A body of salt water will do the greatest damage to lthe metal parts.

e. Training. All operators should receive through training in the destruction of the truck mounted water purification unit. Simulated destruction, using all of the methods listed above, should be included in the operators training program. It must be emphasized in training that demolition operations are usually necessitated by critical situations when the time available for destruction is limited. For this reason, it is necessary that the operators and maintenance personnel be thoroughly familiar with all methods of destruction and be able to carry out demolition instructions without reference to this or any other manual.

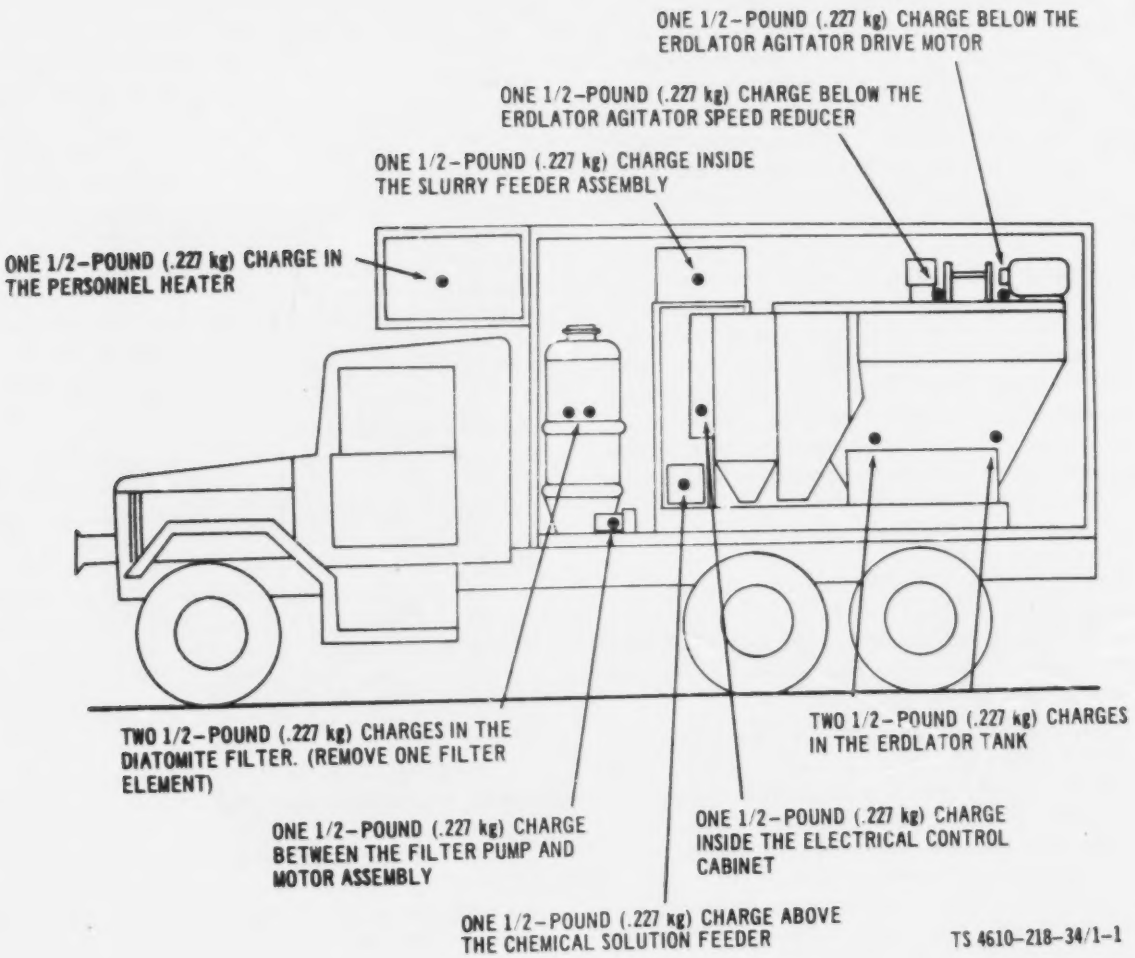
ONE 1/2-POUND (.227 kg) CHARGE BELOW THE ERDLATOR AGITATOR DRIVE MOTOR
ONE 1/2-POUND (.227 kg) CHARGE BELOW THE ERDLATOR AGITATOR SPEED REDUCER
ONE 1/2-POUND (.227 kg) CHARGE INSIDE THE SLURRY FEEDER ASSEMBLY
ONE 1/2-POUND (.227 kg) CHARGE IN THE PERSONNEL HEATER
TWO 1/2-POUND (.227 kg) CHARGES IN THE DIATOMITE FILTER. (REMOVE ONE FILTER ELEMENT)
TWO 1/2-POUND (.227 kg) CHARGES IN THE ERDLATOR TANK
ONE 1/2-POUND (.227 kg) CHARGE BETWEEN THE FILTER PUMP AND MOTOR ASSEMBLY
ONE 1/2-POUND (.227 kg) CHARGE INSIDE THE ELECTRICAL CONTROL CABINET
ONE 1/2-POUND (.227 kg) CHARGE ABOVE THE CHEMICAL SOLUTION FEEDER
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Figure 1-1. Placement of Charges for Demolition of Water Purification Unit

Section II. DESCRIPTION AND DATA

1-7. Description.

a. General. The 1500 gph (gallons per hour) water purification unit is installed in a van type body, mounted on a 2-1/2-ton truck. Supporting equipment required for the unit includes a 10 KW (kilowatt) engine-driven generator set, mounted on a standard 1-1/2-ton cargo trailer. Three collapsible fabric tnaks, each with a capacity of 1500 gallons, are required for operation. Three portable centrifugal pumps, two being electric driven, and one gasoline engine driven, along with a 30-day supply of chemicals and the necessary hose assemblies are inciuded with this unit. The primary purpose of the water purification unit is to produce potable and palatable drinking water from fresh water sources, at the rate of 1500 gallons per hour. The maintenance paragraphs of this manual contains detailed descriptions of its components. No known differences of this model exist.

NOTE

See SC 4610-97-CL-E05 for variation of end item components for use in CONUS (Continental United States) and MAP (Mutual Assistance Program) countries.

b. Van Body. The van body has a rear door (fig. 1-2) and a side door. A ladder (fig. 1-3) is supplied for each door. It has four lifting shackles (fig. 1-2), two at the lower front and two at the lower rear corners. The van is equipped with two separate electric systems; a 24-volt dc, and a 120-volt ac. The clearance ligha are mounted on the top front and rear, and in pairs mounted at the upper corners of the front and rear sides of the van body. The top lights in front and front sides have amber lenses and the lower ones have amber blackout lenses. The top lights at the rear and rear sides have red lenses and the lower ones have red blackout lenses. All clearance lights are 24 volt. There are eight reflectors on the water purification van body, four red ones on the rear of the van body, and four amber ones on the front. A filtered water outlet cap is located on the left side of the van body. There are two waste water outlet caps, one on each side of the van body, and two cable outlet caps, one located on each side of the van body. There is a water inlet on the right side of the van body. There are three screened windows, one at each side and one at the rear. The side windows are stationary, but the rear one can be opened with a crank from the inside. The van is equipped with three levels, one on each side and one at the rear, for leveling the unit. The van body bonnet contains an installed personnel heater. The upper and lower side doors (fig. 1-3), when open, permit removal or replacement of the erdlator assembly and may be used as an operating platform in temperate weather.

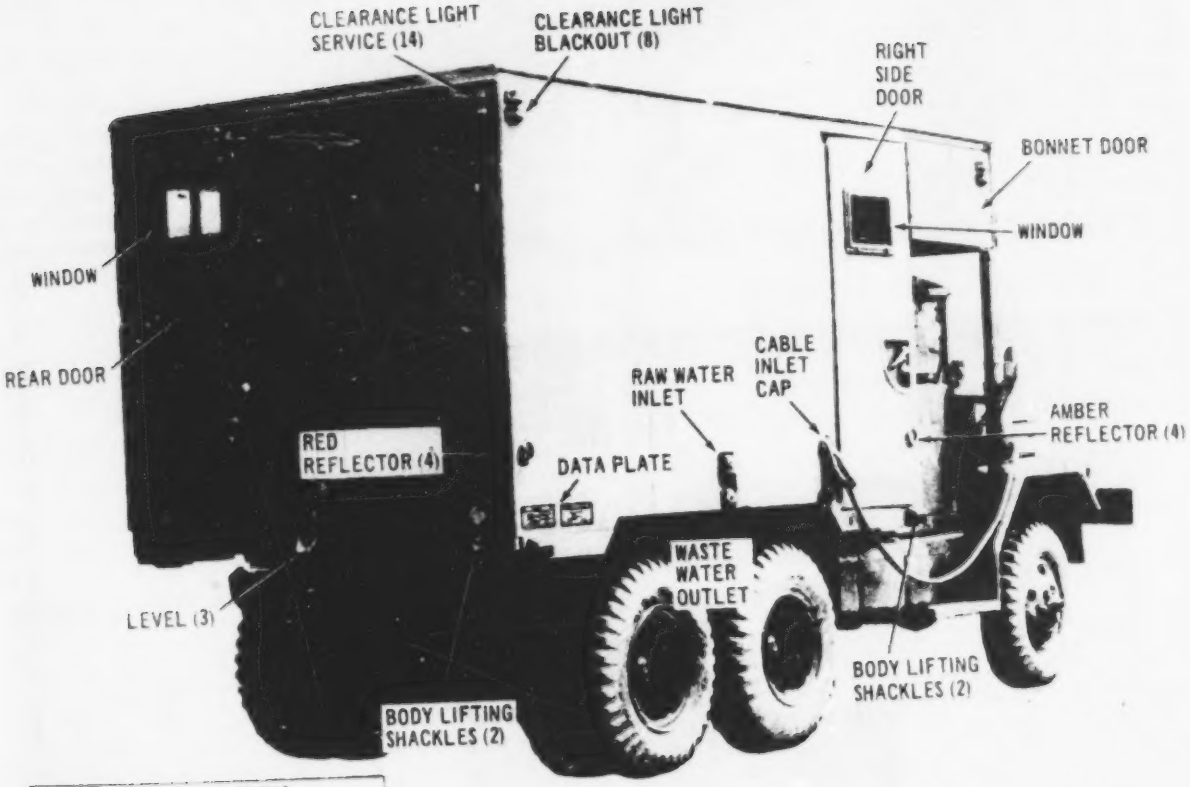
c. Personnel Heater. Each van body is equipped with a gasoline burning personnel heater located in the bonnet end of the van body. It is used to maintain above freezing temperatures inside the van body and protect the equipment and personnel during cold weather.

d. Erdlator Assembly.

(1) General. The erdlator assembly includes the agitator speed reducer and drive motor, supported by the bridge rail assembly (fig. 1-3). Other components of the erdlator assembly (fig. 1-4) are two influent launders, an effluent launder, wet well tank, sludge concentrator tank, slurry weir box, downcomer tube and the agitator shaft (with disks). It is mounted on a separate steel plate, attached to the van body floor. The erdlator assembly reduces the contents of the organic and suspended matter of the water, producing an effluent suitable for application to the diatomite filter.

(2) Erdlator tank. The erdlator tank is a circular, funnel-shaped unit of one-piece aluminum construction, with a capacity of approximately 530 gallons. A stub shaft and bearing support (fig. 1-4) for the agitator is mounted in the bottom of the tank. There is a baffle ring near the bottom, secured to the tank with a series of short baffles which support the downcomer tube. A draw-off port is located opposite the slurry weir box and another near the top which opens into the wet well. There are two drains, an upper one for partial draining and the lower one for complete draining. The erdlator tank serves as a separator which hydraulically separates the slurry blanket from the clear water in the upper section of the tank, in what is termed as the separator zone. It also serves as a clarifier, as the flow of coagulated water is deflected at the bottom of the tank and directed in an upward rotating direction into the clarification zone.

(3) Influent launder. The two influent launders are contructed of aluminum and are attached to the bridge rail assembly (fig. 1-4). The raw water is introduced into the influent laun-



SHIPPING DIMENSIONS	
LENGTH	280 INCHES (7.1 m)
WIDTH	98 INCHES (2.5 m)
HEIGHT	131 INCHES (3.3 m)
WEIGHT	18,180 POUNDS (8250.1 kg)

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Figure 1-2. Van Body, Mounted on Truck Chassis, Right Side View

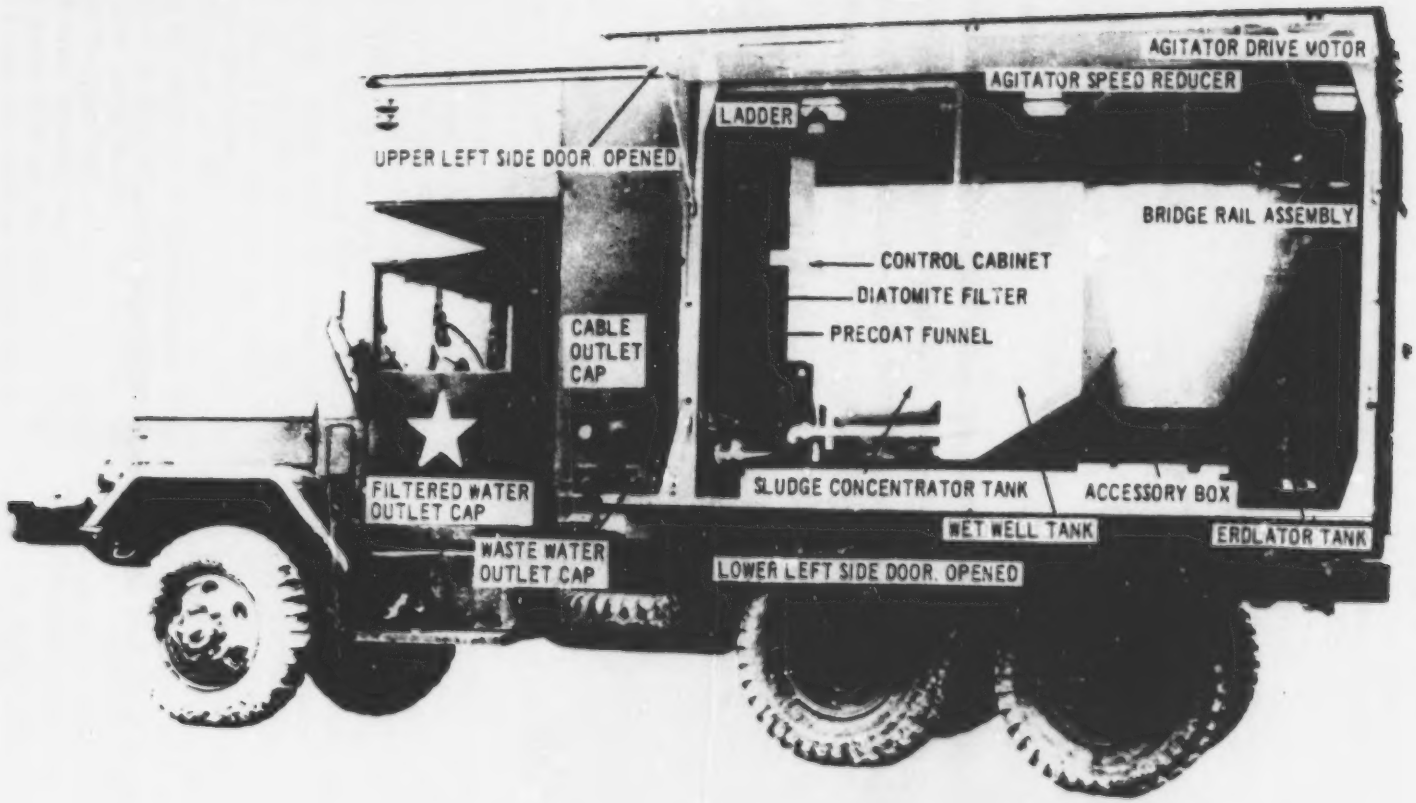


Figure 1-3. Open Van Body with Installed Equipment, Left Side

ders through four aspirators (fig. 1-4), from where it overflows into the downcomer tube, or mixing zone.

(4) Effluent launder. The effluent launder is a one piece, circular-shaped aluminum through that surrounds the downcomer tube. It ie attached to the bridge rail assembly by three adjustable support rods. It collects the clear water from the upper section of the erdlator tank and discharges it into the wet well tank.

(5) Wet well tank. The wet well tank is made of aluminum, and consists of a triangular section welded to the rear quadrant of the erdlator tnak for the collection of the effluent from the erdlator. The capacity of the wet well tank is approximately 150 gallons. It provides for limited storage of coagulated water, and serves as a sump for the suction of the filter pump. It contains an overflow pipe, to permit operation of the erdlator at the rated capacity when the filters are stopped. A drain in the bottom of the wet well permits complete drainage of the tank to waste when water unsited for filtering is obtained from the erdlator.

(6) Sludge concentrator tank. The sludge concentrator tank is welded externally to the front of the wet well tank. It is a square, funnel-shaped aluminum tank with a shorter circular tank welded to the inside of it. There is an inlet inside of the main tank near the bottom which permits the woolly slurry to enter by gravity. The inner tank has an opening in the bottom, controlled by a manually-operated plug valve to

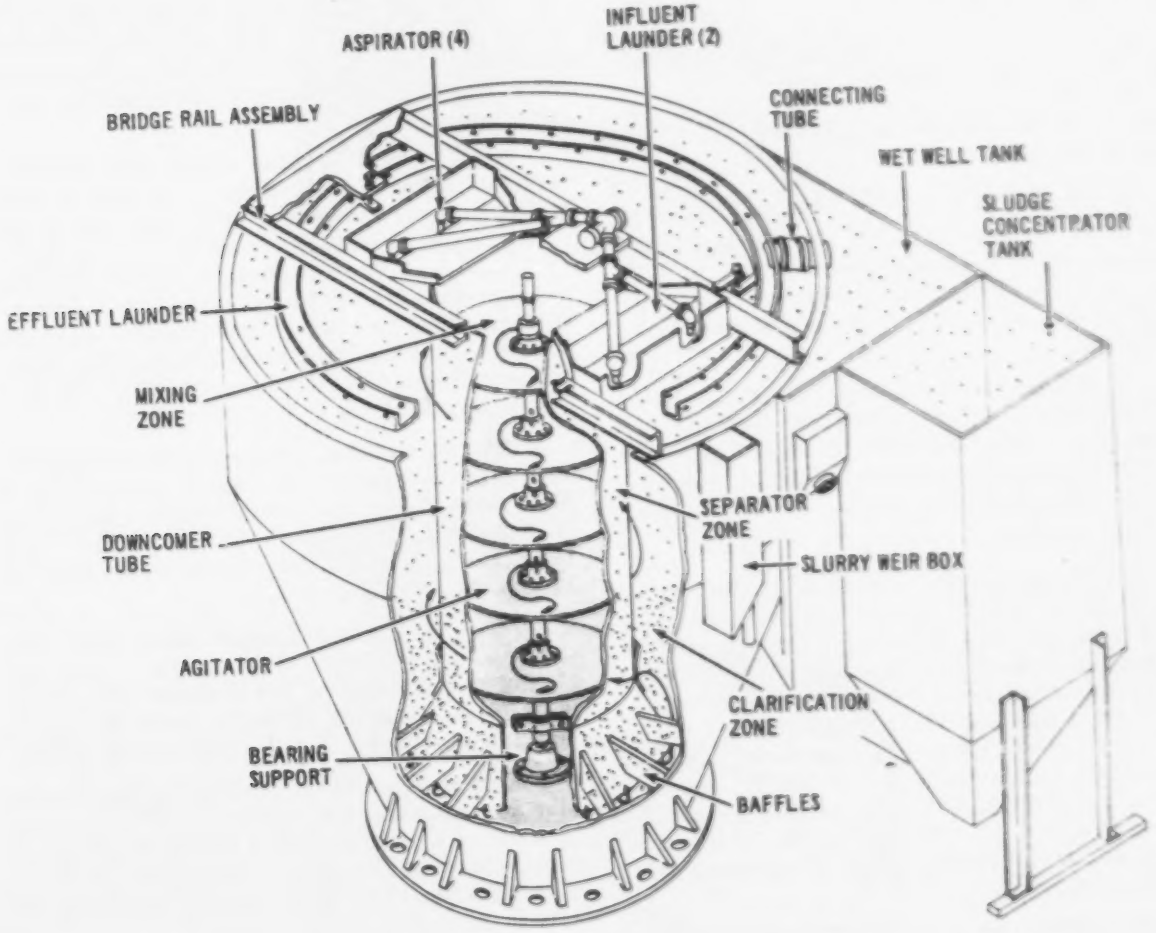


Figure 1-4. Cross Section of the Erdlator Assembly

permit intermittent drainage of the slurry to waste. There is an outlet near the top of the main tank with a manually-operated valve to control the flow of clear coagulated water to the wet well. There is also an outlet in the bottom for draining the tank.

(7) Slurry weir box. The slurry weir box (fig. 1-4) is a small aluminum tank welded externally to the erdlator tank. It houses the draw-off port near the top of the erdlator and permits gravity flow of flocculent slurry from the erdlator tank to the sludge concentrator tank.

(8) Agitator shaft and downcomer tube. The agitator shaft consists of a tubular shaft with five equally-spaced circular disks attached. It is mounted in the center of the erdlator tank on the bearing support. The agitator shaft is surrounded by the downcomer tube and baffle ring to form the mixing zone.

(9) Agitator speed reducer. The speed reducer (fig. 1-3) is mounted on brackets attached to the agitator bearing mounting plate. It reduces the speed from the agitator drive motor to the erdlator agitator drive shaft.

(10) Agitator drive motor. The agitator drive motor is mounted on an adjustable sliding base attached to the bridge rail assembly. It is a three-phase, totally enclosed motor, with oblong mounting holes in the base for adjustment and alignment.

(11) Bridge rail assembly. The bridge rail assembly consists of two aluminum channels attached to the top of the erdlator tank. They are used for supporting components of the erdlator assembly located over the tank.

e. Filter Section.

(1) Diatomite filter. The filter section contains a diatomite filter (fig. 1-3) specially designed to employ the filtration properties of diatomaceous earth. Thefilter is essentially a two-part cylinder containing six filter elements, each with a total filtering area of 10.02 square feet. The filter has two pressure gages for indicating the pressure on the influent and effluent side of the filter, a precoat funnel for adding prepared diatomite slurry for precoating the filter elements, and an air release valve for releasing air trapped in the filter.

(2) Valves and piping. A flow controller valve is located in the effluent filtered water line of the filter to maintain a fixed constant rate of flow through the filter. There are also additional valves and piping necessary for operation of the filter.

(3) Filter pump. The filter section contains a filter pump for pumping the coagulated water through the filter.

f. Chemical Feed Equipment.

(1) Chemcial slurry feeder. The chemical slurry feeder (fig. 1-5) consists essentially of an aluminum tank divided into two equal watertight compartments. The two compartments are covered with one hinged cover. Each compartment has four agitators with two measuring cups attached to diametrically opposite agitators, a clear-plastic window, drain outlets, collecting funnel, filling connection, and rate-of-discharge controller. The chemical slurry feeder agitators operate from a common shaft and rotates vertically. Each compartment functions as a separate unit, permitting two different chemical solutions to be fed at the same time. The chemical slurry feeder tank supplies pulverized limestone slurry (coagulation aid) to the erdlator tank and diatomite slurry to the diatomite dilution tank.

(2) Chemical solution feeder. The chemical solution feeder is constructed of material having anticorrosive resistance and is mounted to the first shelf of the chmical feed equipment frame. It consists of two diaphragm pumps operated from one electric motor by means of a gear reduction mechanism. The chemical solution feeder pumps ferric chloride and calcium hypochlorite solution from two chemical tanks into the mixing zone (fig. 1-4) of the erdlator tank.

(3) Chemical slurry feeder speed reducer. The chemical slurry feeder speed reducer (fig. 1-5) is mounted on the second shalf of the chemical feed equipment frame. It reduces the speed from the slurry feeder drive motor to the feed agitator. The ratio is 60 to 1.

(4) Chemical slurry feeder drive motor. The chemical slurry feeder drive motor is mounted on the second shelf of the chemical feed equipment frame. It drives the slurry feeder through a speed reducer and chain drive safety slip clutch.

(5) Diatomite slurry dilution tank assembly. The diatomite slurry dilution tank assembly is made of aluminum and welded watertight. It is mounted to the slurry feeder tank and provides storage of diatomite slurry to supply the suction line of the filter pumps.

(6) Chemical solution tanks and covers. There are two chemical solution tanks, located under the chemical solution feeder. These tanks are made of steel, lined with synthetic rubber molded to the metal. They are used to store a

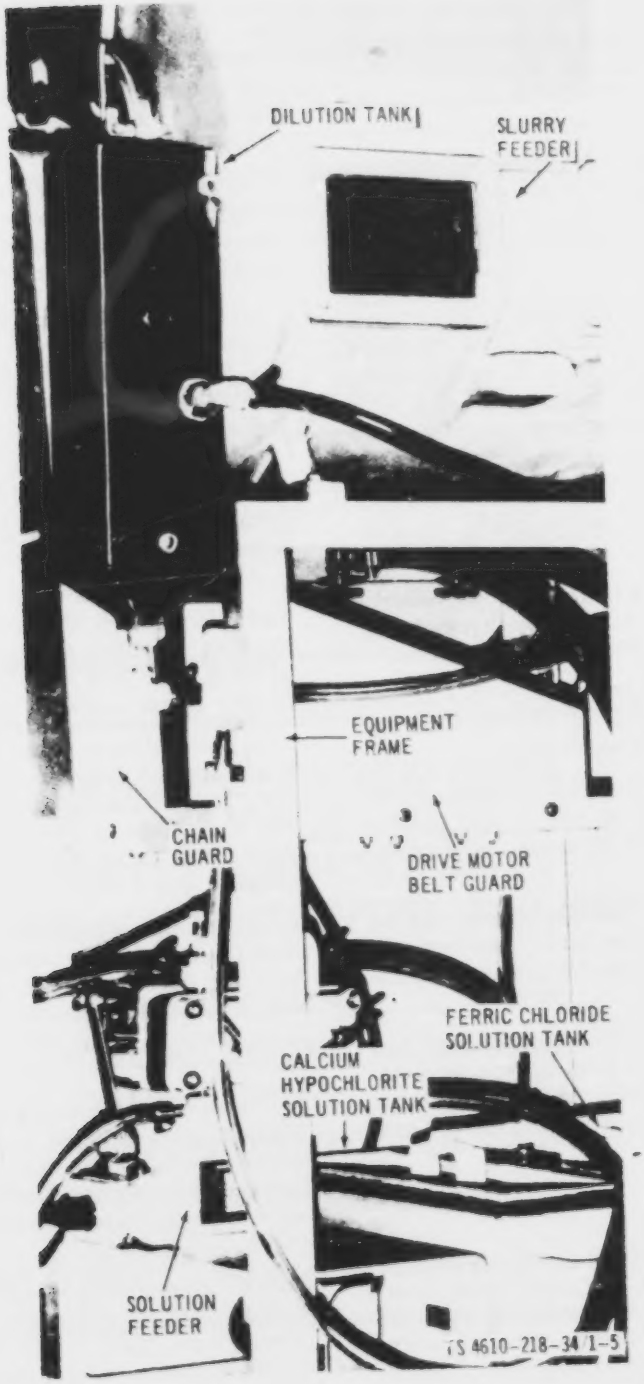


Figure 1-5. Chemical Feed Equipment, Installed.

supply of chemicals for the solution feeder pumps, one supplies calcium hypochlorite, and the other ferric chloride.

(7) Safety slip clutch. The safety slip clutch is located on the drive end of the slurry feeder agitator shaft. It protects the drive components from damage when an overload is applied to the agitator shaft.

(8) Chain tightener. The chain tightener is mounted near the cneter of the chemical feed equipment frame. It consists of a sprocket and shaft and is used to increase or decrease the drive chain tension.

g. Electrical Control Cabinet. The electrical control cabinet (fig. 1-3) is mounted to the front of the sludge concentrator tank. It contains the circuit breakers, motor starters, ON and OFF switches, transformer, receptacles, low water alarm toggle switch, alarm buzzer, and warning light indicator.

h. Raw Water Pump. A self-priming, centrifugal, electric-driven pump is furnished for each water purification unit.

i. Distribution Pump. An electric-driven pump is furnished with each water purification unit.

j. Storage Tanks. Three collapsible fabric tanks, each with a capacity of 1500 gallons, are required for storing the filtered water.

k. Generator Set. A gasoline, engine-driven generator set is required to supply the electric power for the operation of the water purification unit.

l. Hoses and Fittings. Sufficient hoses and fittings are furnished with the basic issue items to equip the water purification unit for normal operation.

m. Piping and Valves. The unit is equipped with piping and valves of four different colors. Black indicates raw water; yellow, coagulated water; red, waste water; and green, filtered water.

1-8 Identification.

a. The transportation data plate, located on the right rear of the van body, provides information pertaining to transportation. It gives the overall length, width, and height in inches, shipping cubage in cubic feet, shipping weight in pounds, and set stock number (set consists of chassis, van, and trailer) (fig 1-6).

b. The set data plate is located on the right rear side of the van body. It gives the nomenclature, National Stock Number, serial number, registration number, manufacturer, model number, contract number, date manufactured, length, width, height, shipping weight, cubage feet, capacity or pay load, gross vehicle weight, data list, specification revisions, inspection stamp and date inspected (fig. 1-6).

c. The erdlator identification plate, located on the front of the erdlator tank, specifies the manufacturer, model number, seriel number and part number, design activity and contract number.

d. The chemical slurry feeder identification plate, located on the front of the feeder, specifies the name of the unit, the manufacturer, serial number, model number, part number, design activity, and contract number.

e. The diatomite filter identification plate, located on front of the filter, specifies the manufacturer, model, serial and part number, design activity, and contract number.

f. The chemical solution feeder identification plate, located on the end of the solution feeder housing, specifies the manufacturer, feeder part number, model and serial number, volts, cycle (hertz), phase amperes, and NSN.

g. The erdlator agitator speed reducer identification plate, located on the speed reducer hosuing, specifies the manufacturer, type, gear, model number, service factor, ratio, input and output rpm, input horsepower, torque, and serial number.

h. The chemical slurry feeder speed reducer identification plate, located on the speed reducer housing, specifies the manufacturer, model number, service factor, input and output rpm, torque, type, gear ratio, input horsepower, and serial number.

i. The erdlator agitator drive motor identification plate, located on the side of the motor stator, specifies the manufacturer, horsepower, type, serial number, hertz, rpm, amperes, temperature rise, frame number, and code.

j. The raw water or distribution pump motor identification plate, located on top of the motor stator cover, specifies the manufacturer, horsepower, rpm, type, frame number, phase, volts, amperes, hertz, model, type, duty, temperature rise, lead line, and connection data.

U.S.					
WATER PURIFICATION UNIT (VAN), 1500 GPH TRUCK MOUNTED					
STOCK NO.					
SERIAL NO.			REG NO.		
MFG	EMC INDUSTRIES INC.		MODEL	EMC-1500S	
CONTR NO.	DAAK01-76-C-5661		DATE MFD		
LENGTH	194 IN.	WIDTH	98 IN.	HEIGHT	90 IN.
CAP. OR PAY LOAD				G.V.W.	LBS
SHIP WT			CUBE	936 CU.FT	
DATA LIST	DL 13208E4556			REV	
SPEC	MIL-W-52482			REV	
			INSP STAMP		DATE INSP

TRANSPORTATION DATA
FOR
WATER PURIFICATION SET
VAN BODY MOUNTED-1500 GPH

OVERALL LENGTH ——— 194 IN.
OVERALL WIDTH ——— 98 IN.
OVERALL HEIGHT ——— 90 IN.
SHIPPING CUBAGE — 936 CU. FT.
SHIPPING WEIGHT —
SET STOCK NO. —
(SET CONSISTS OF CHASSIS, VAN AND TRAILER)

TS 4610-218-34/1-6

Figure 1-6. Data Plates for Water Purification Set, Van Body Mounted - 1500 GPH

k. The raw water or distribution pump identification plate, located on the cover plate opposite the drive end of the pump, specifies the manufacturer, type, serial number, gallons per minute, and head feet of the pump.

l. The filter pump motor identification plate, located on top of the motor stator cover, specifies the manufacturer, ac motor, horsepower, serial and frame number, rpm, volts, hertz, phase, amperes, type, code, time rating, temperature, rating, serial and manufacturer.

m. The filter pump identification plate, located on the pump housing, opposite the drive end, specifies the manufacturer, type, number, capacity, gpm, head feet, and serial number.

n. The heater identification and instruction plate, located on the front of the heater near the controls, provides instructions for starting, operating, and stopping the heater. It specifies the manufacturer, model and serial numbers, volt, amperes and btu rating.

o. The chemical slurry feeder motor identification plate, located on top of the motor stator cover, specifies the manufacturer, horsepower, rpm, volts, hertz, frame number, serial number, phase, amperes, temperature rise, and code.

p. The flow controller valve identification plate, located on the front of the valve, specifies the manufacturer and model number, and provides a scale to determine gallons per minute of water passing through the control valve.

q. The wiring identification plate is mounted in the van body. It specifies 24 and 120-volt wiring, and the color of the wire to the various components.

r. The wiring diagram is mounted on the inner side of the electrical control cabinet door.

1-9. Tabulated Data.

a. General. This paragraph contains all maintenance data pertinent to direct and general support maintenance personnel. A van body wiring diagram and a water purification unit wiring diagram are also included in this manual.

b. Tabulated Data, Direct Support.

General

- Manufacturer ..... EMC Industries Inc.
- Model 1500S
- Mounting ..... Van body mounted
- Capacity ..... 1500 GPH (5670 L)

Erdlator tank

- Capacity ..... 530 gal. (2003.4 I)

Erdlator agitator speed reducer

- Service factor 1
- Horsepower 1 1/4
- Ratio ..... 12 to 1
- Torque ..... 400 lb./in. min. (460 cm kg/min)
- Input rpm 1800
- Input shaft:
  - Diameter ..... 5/8 in. (15.88 mm)
  - Length ..... 1 3/4 in. (44.45 mm)
  - Key ..... 3/16x3/32x1 1/2 in. (4.76 mmx2.38mmx38.1mm)
- Output shaft:
  - Diameter ..... 3/4 in. (19.05mm)
  - Length ..... 1 13/16 in. (30.16mm)
  - Keyway ..... 3/16x3/32x1 5/8 in. (4.763mmx2.381mmx41.28mm)

Erdlator agitator shaft assembly

Erdlator agitator shaft

- Agitator lower shaft, length ..... 54 5/16 in. (1.380m)
- Agitator lower shaft, diameter ..... 2 1/2 in. (6.35 cm)
- Agitator top shaft, length ..... 20 1/4 in. (51.44cm)
- Agitator top shaft, diameter ..... 1/2 in. (12.7mn)
- Keyway for top shaft ..... 3/32 x 3/32 x 1 3/8 in. (2.38mm x 2.38mm x 34.93)

Erdlator agitator lower shaft bearing

- Inside diameter of bearing ..... 1 21/64 in. (33.73mm)
- Outside diameter of bearing ..... 2 in. (5.08mm)

Length of bearing.....4 1/2 in. (11.43mm)
Thickness of rubber lining.....5/11 in. (7.94mm)
Thickness of bronze shell.....1/8 in. (3.18mm)
Width of rubber lining grooves.....1/8 in. (3.18mm)
Depth of rubber lining grooves.....3/32 in. (2.38mm)

Low water level warning buzzer

Voltage.....8
Hertz.....60

Electrical control cabinet

Voltage.....120
Hertz.....60

Chemical slurry feeder

Type.....2 compartment
Overall width of tank.....35 3/4 in. (90.81cm)
Overall height of tank.....27 3/8 in. (69.53cm)
Dept of tank.....26 1/4 in. (66.68cm)
Agitator shaft, overall length including extension shaft.....25 13/16 in. (65.56cm)
Agitator shaft, less extension.....22 1/8 in. (56.20cm)
Agitator extension shaft, overall length.....4 3/16 in. (10.64 cm)
Agitator shaft diameter.....1 7/32 in. (30.96mm)
Keyway for agitator extension shaft.....3/16x3/32x1 5/16 in. (4.76mm x2.381mm x49.21mm)
Diameter of agitator extension shaft.....3/4 in. (19.05mm)
Overall length of afitator arm.....10 1/2 in. (26.67cm)
Overall length of agitator measuring cup.....4 3/4 in. (12.07cm)
Overall diameter of agitator measuring cup.....3 1/2 in. (8.90cm)

Diatomite dilution tank

Inside diameter of tank.....5 in. (12.7cm)
Overall length of tank.....19 1/2 in. (49.53cm)
Overall length of float.....8 1/4 in. (20.10cm)
Thread size of float insert.....1/4-28 UNF-2B
Overall length of float needle valve.....1 3/4 in. (44.45mm)
Diameter of loat needle valve.....1/2 in. (12.7mm)
Thread size of float needle valve.....1/4-28 UNF-2B

Chemical slurry feeder speed reducer

Input speed.....1800 rpm

Horsepower.....3/4
Output speed.....29 rpm
Service factor.....1
Ratio.....60 to 1
Input shaft:
Diameter.....3/4 in. (19.05)
Length.....2 1/8 in. (5.40cm)
Keyway.....3/16x3/32x2 in.
(4.76 mm x2.381mm x5.08cm)

Output shaft:
Diameter.....1 in. (25.4mm)
Length.....2 11/16 in. (6.83mm)
Keyway.....1/4x1/8x2 1/4 in.
(6.35mm x3.175mm x5.72cm)

Diatomite filter pump motor
Horsepower.....2
Phase.....2
Hertz.....60
Speed.....3450 rpm
Frame.....56C
Volts.....208
Overall length.....13 1/2 in. (34.29cm)
Overall length, less extended shaft.....11 7/16 in. (29.05cm)
Diameter of motor.....6 3/8 in. (16.193cm)
Motor shaft keyway.....3/16x1 3/4 in.
(4.76mm x 44.45mm)
Motor shaft diameter.....5/8 in. (15.88mm)
Motor shaft length.....11 5/16 in. (28.73cm)
Type of ball bearing.....sealed
Length of terminal leads.....6 to 7 in. (15.24cm to 17.78cm)

c. *Tabulated Data, General Support.*

Van body
Overall length.....194 in. (4.93m)
Overall width.....98 in. (2.49m)
Overall height.....90 in. (2.29m)
Shipping cubage.....2,144 cubic ft. (60.03m3)

Approximate weight	8,065 lbs. (3659.90kg)
Raw water flow indicator	
Flow rate	0.60 gpm(0-226.8 L/min)
Length	4 1/2 in. (11.43cm)
Diameter	3 1/4 in. (8.26cm)
Servicing working pressure	400 psi(28.13 kg/cm2)
Chemical solution feeder	
Feed rate	1/2 to 2 1/2 gph(1.89 to 9.45 L/hr)
Feeder oil capacity	1 1/4 qt. (1.18 L)
Length of lever arm shaft	6 9/16 in. (16.67cm)
Diameter of lever arm shaft	3 in. (7.62cm)
Length of positioner shaft	3 in. (7.62cm)
Length of opposite positioner shaft	2 9/16 in. (6.51cm)
Length of push rod	7 in. (17.78cm)
Thread size of diaphragm	5/8-27 UNS-2A
Diameter of diaphragm	3 3/8 in. (8.57cm)
Length of main shaft	8 1/2 in. (21.59cm)
Diameter of main shaft	5/8 in. (15.88mm)
Adjustable flow controller	
Flow range	10 to 30 gpm(37.8 to 113.4 L/min)
Capacities	
Erdlator tank	530 gal. (2003.4 L)
Filter	continuous
Wet well tank	150 gal. (567 L)
Water production rate	25 gpm (94.5 L/min)
Slurry feeder (each compartment)	14 gal. (52.92 L)
Water rise rate at 1500 gph	1.1 gpm per sq. ft. (44.95 L/min per m2)
Sludge concentrator tank	180 gal. (680.4 L)
Water treatment time at 1500 gph	18.6 min.
Chemcial solution tanks (each)	5 gal. (18.9 L)
Chemical solution feeder gear case	1 1/4 qts. (1.18 L)

d. **Nut and Bolt Torque Data.**

Size nut or bolt	Torque (ft.-lb.)	Size nut or bolt	Torque (ft.lb.)
1/4-20	7-9	9/16-12	90-100
1/4-28	8-10	9/16-18	107-117
6/16-18	13-17	5/8-11	137-147
5/16-24	15-19	5/8-18	168-178
3/8-16	30-35	3/4-10	240-250

e. Dimension and Clearance. Figure 1-7 shows the dimension and clearance for the water purification unit.

f. Wiring Identification Plate, Van Body. FO 1 shows the wiring diagram for the van body.

g. Wiring Identification Plate, Water Purification Unit. FO 2 shows the wiring diagram for the water purification unit electrical system.

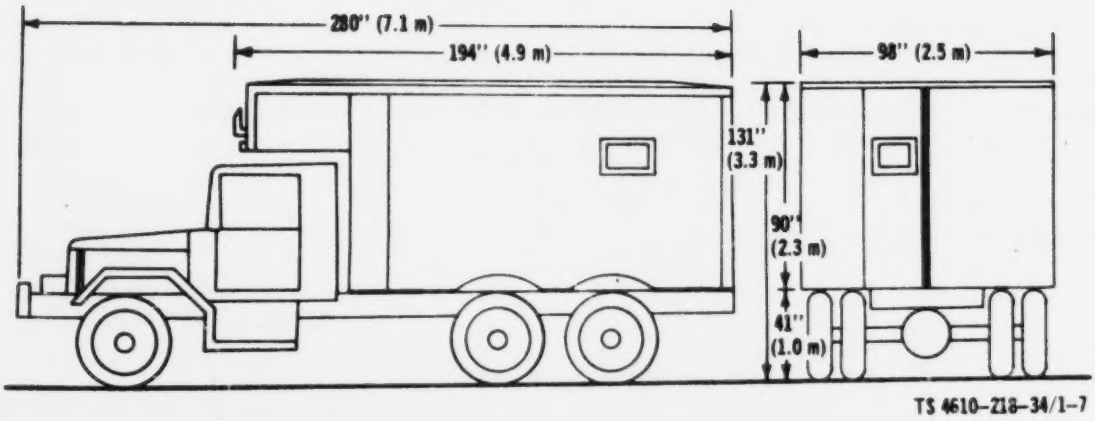


Figure 1-7. Dimension and Clearance

CHAPTER 2
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

2-1. Special Tools and Equipment. No special tools and equipment are required by direct support and general support maintenance personnel for performing maintenance on the water purification unit.

2-2. Repair Parts. Repair parts are listed and illustrated in the repair parts and special tools list manual covering direct support and general support maintenance for this unit in TM 5-4610-218-34P, Direct Support and General Support Maintenance Repair Parts and Special Tools List Manual (Including Depot Maintenance Repair Parts and Special Tools List).

2-3. Fabricated Tools and Equipment. No specially designed or fabricated tools and equipment are required by direct support and general support maintenance personnel for performing maintenance on the water purification unit.

Section II. TROUBLESHOOTING

2-4. General.

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the water purification unit. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunciton is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. The table lists the common malfunctions which you may find during the operation or maintenance of the water purification unit or its components. You should perform the tests/inspections and corrective actions in the order listed.

Table 2-1. Troubleshooting

MALFUNCTION *TEST OR INSPECTION* CORRECTIVE ACTION
WATER TREATMENT SECTION
1. AGITATOR OPERATION NOISY, TOO SLOW, OR WILL NOT RUN.
Step 1. Inspect for worn or broken agitator bearing support.
Replace a damaged agitator bearing support (para. 4-3).
Step 2. Check for bent or distorted agitator disks.
Replace damaged or defective disks (para. 4-3).
Step 3. Check for a bent agitator shaft.
Replace a defective agitator shaft (para. 4-3).
2. NO ELECTRIC POWER TO THE WATER TREATMENT EQUIPMENT.
Step 1. Inspect for dirty terminals or loose connections.
Clean terminals, tighten loose connections.

Table 2-1. Troubleshooting-(Continued)

MALFUNCTION *TEST OR INSPECTION* CORRECTIVE ACTION

Step 2. Inspect the main power cable leads for improper connections.

Connect the cable leads (FO 2).

Step 3. Check for a defective main power cable.

Replace a defective main power cable (FO 2).

3. SPEED REDUCERS BIND OR RUN NOISY.

Step 1. If the speed reducer binds, check for a worn or bent shaft.

Replace a defective shaft (para 4-2 and 5-3).

Step 2. If the speed reducer binds, check for a lack of proper lubrication.

Lubricate in accordance with LO 5-4610-218-12.

Step 3. If the speed reducer runs noisy, check for worn or chipped gears.

Replace worn or defective gears (para. 4-2 and 5-3).

Step 4. If the speed reducer runs noisy, check for a lack of proper lubrication.

Lubricate in accordance with LO 5-4610-218-12.

CHEMICAL FEED EQUIPMENT

4. CHEMICAL SLURRY FEEDER WILL NOT RUN, OR RUNS HOT.

Step 1. If the chemical slurry feeder will not run, check for a broken through shaft.

Replace a defective through shaft (para. 5-1).

Step 2. If the chemical slurry feeder runs hot, check for worn or broken shaft bearings.

Replace defective bearings (para. 5-1).

Step 3. If the chemical slurry feeder runs hot, inspect for a bent or twisted housing.

Replace a damaged housing (para. 5-1).

5. CHEMICAL SOLUTION FEEDER WILL NOT RUN, OR RUNS NOISY.

Step 1. If the chemical solution feeder does not run, check for a broken feeder shaft.

Replace a damaged feeder shaft (para. 5-4).

Step 2. If the chemical solution feeder does not run, check for a defective receptacle base.

Replace a defective receptacle base (para. 5-4).

Step 3. If the chemical solution feeder does not run, check for broken internal wiring.

Repair or replace the internal wiring (para. 5-4).

Step 4. If the chemical solution feeder runs noisy, inspect the bearings and sleeves for we

Replace defective bearings and sleeves (para. 5-4).

Step 5. If the chemical solution feeder runs noisy, see if the spur gears are worn or broke

Replace the spur gears (para. 5-4).

DIATOMITE FILTER SECTION

6. AIR RELEASE VALVE WILL NOT HOLD PRESSURE.

Step 1. Check for a broken air release valve diaphragm.

Replace a defective diaphragm (para. 6-1).

Table 2-1. Troubleshooting-(Continued)

MALFUNCTION *TEST OR INSPECTION* CORRECTIVE ACTION

Step 2. Check for a worn or broken valve spring.

Replace a defective spring (para. 6-1).

Step 3. Inspect the air release valve check valve for clogs or corrosion.

Clean or replace the check valve (para. 6-1).

Step 4. Inspect for broken air release valve tubing.

Replace broken tubing (para. 6-1).

7. AIR RELEASE VALVE FAILS TO RELEASE, OR RELEASES TOO SLOW.

Step 1. Check for a bent or corroded diaphragm push rod.

Replace a defective push rod (para. 6-1).

Step 2. Inspect the check valve for clogs, corrosion, or defects.

Clean or replace the check valve (para. 6-1).

Step 3. Check for a crimped or clogged tube assembly.

Clean or replace the tube assembly (para. 6-1).

8. FILTER PUMP MOTOR WILL NOT RUN, OR IS NOISY DURING OPERATION.

Step 1. If the pump motor does not run, check for defective wiring.

Repair wiring (para. 6-3).

Step 2. If the pump motor does not run, check for open or shorted field or stator wiring.

Replace field or stator wiring (para. 6-3).

Step 3. If the pump motor is noisy during operation, check for a bent rotor shaft.

Replace a defective rotor (para. 6-3).

Step 4. If the pump motor is noisy during operation, inspect the bearings for wear or cracks.

Replace defective bearings (para. 6-3).

Section III. GENERAL MAINTENANCE

2-5. General Maintenance.

a. General. This paragraph contains the maintenance functions for the major components/assemblies as authorized by the Maintenance Allocation Chart to direct support and general support maintenance personnel that are contained in the following paragraphs of this manual. Below, is a breakdown of those maintenance functions allocated to direct support, and a breakdown of the maintenance functions allocated to general support.

b. Direct Support.

(1) Erdlator tank. Repair, replace.

(2) Ladder assembly. Repair.

(3) Erdlator agitator speed reducer. Repair.

(4) Erdlator agitator shaft assembly. Repair, replace.

(5) Low water level warning buzzer. Test, replace.

(6) Electrical control cabinet. Replace.

(7) Chemical slurry feeder. Repair, replace.

(8) Diatomite dilution tank. Replace.

(9) Chemical slurry feeder speed reducer. Repair.

(10) Diatomite filter air release valve. Repair.

(11) Diatomite filter pump motor. Repair, overhaul.

c. General Support.

(1) Van body. Replace.

(2) Van body electrical system. Inspect, repair, replace.

(3) Raw water flow indicator. Repair.

(4) Chemical solution feeder. Overhaul.

(5) Adjustable flow controller. Repai calibrate.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND ASSEMBLIES

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138 °F (38-59 °C).

2-6. General. This section contains instructions for removal and installation of major components as authorized by the maintenance allocation chart.

2-7. Erdlator Tank.

a. Removal. Always remove the components associated with the erdlator tank in the order listed below. The illustrations referenced contains detailed instructions for removing that particular component.

WARNING

Be sure to disconnect the main power supply before proceeding with the following steps.

(1) Remove the low water level sensitive switch as shown in figures 2-1 and 2-2.

(2) Remove all piping and tubing as necessary.

(3) Remove the erdlator agitator drive motor and belt as shown in figures 2-3 and 2-4.

(4) Remove electrical cable clamps securing cables to the bridge rail assembly.

(5) Refer to figure 2-5 and remove the erdlator agitator drive shaft, flexible couplings, and pillow block bearings.

(6) Remove the erdlator agitator speed reducer as illustrated in figure 2-5.

(7) Refer to figure 2-6 and remove the aspirator manifold assembly.

(8) Refer to figure 2-6 and remove the influ ent launders.

(9) Remove the effluent launder connectin tube and adjustable support rods as illustrated i figure 2-7.

(10) Remove the speed reducer mounting plate as illustrated in figure 2-8.

(11) Lift the erdlator agitator shaft assembly up through the van body roof hatch opening.

(12) Remove the nuts, washers, and screws that secure the downcomer tube to the bridge rail assembly shown in figure 2-8.

(13) Remove the bridge rail assembly.

(14) Lift the downcomer tube up through the van body roof hatch opening.

(15) Lift the effluent launder out of the erdlator tank.

(16) Refer to figure 2-9 and remove the agitator shaft bearing support out of the bottom of the erdlator tank.

(17) Remove the sludge concentrator valves and piping as illustrated in figure 2-10.

(18) Refer to figure 2-11 and remove the electrical control cabinet.

(19) Refer to figures 2 12 and 2-13 and remove the erdlator tank away from the van body through the left side doors.

b. Clean, Inspect and Repair.

(1) Clean the sludge from the bottom of the tank with clean water under pressure.

(2) Clean the entire tank with dry cleaning solvent P-D-680. Use a stiff brush to remove sediment and scale.

(3) Inspect the tank for dents, cracks, and punctures.

(4) Repair cracks and punctures by welding. Straighten dents with an aluminum or soft hammer.

(5) Replace the erdlator tank if it can not be repaired.

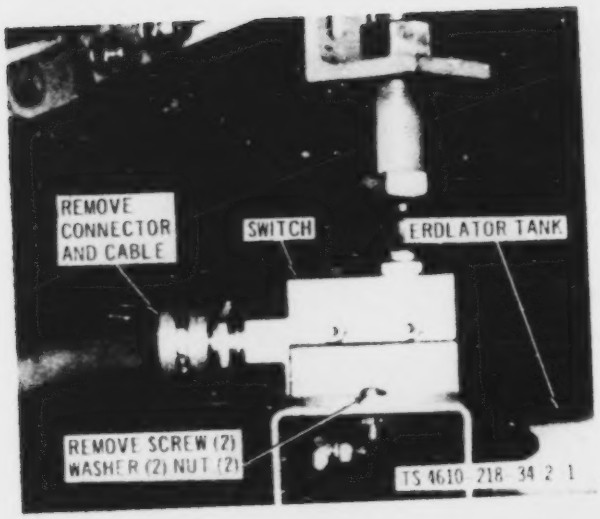
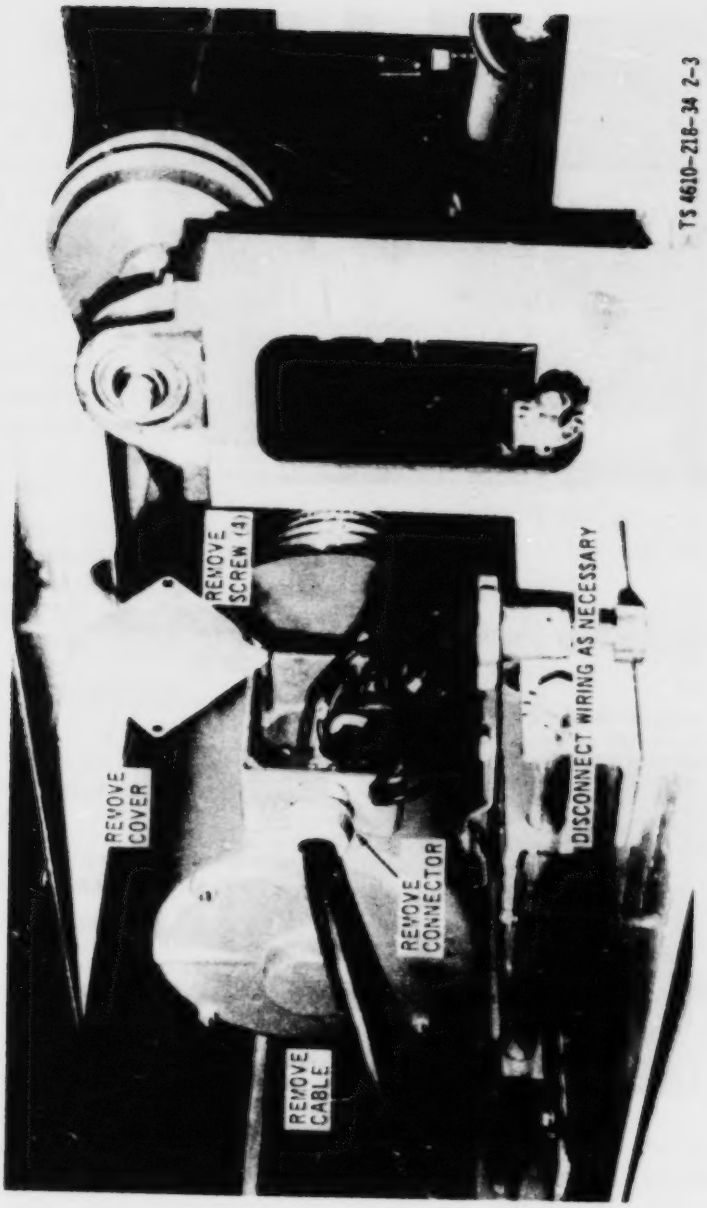


Figure 2-1. Low Water Level Sensitive Switch, Removal and Installation.

Figure 2-2. Low Water Level Sensitive Switch, with Cover Removed


REMOVE COVER
REMOVE SCREW (4)
REMOVE CONNECTOR
DISCONNECT WIRING AS NECESSARY
REMOVE CABLE
TS 4610-218-34 2-3

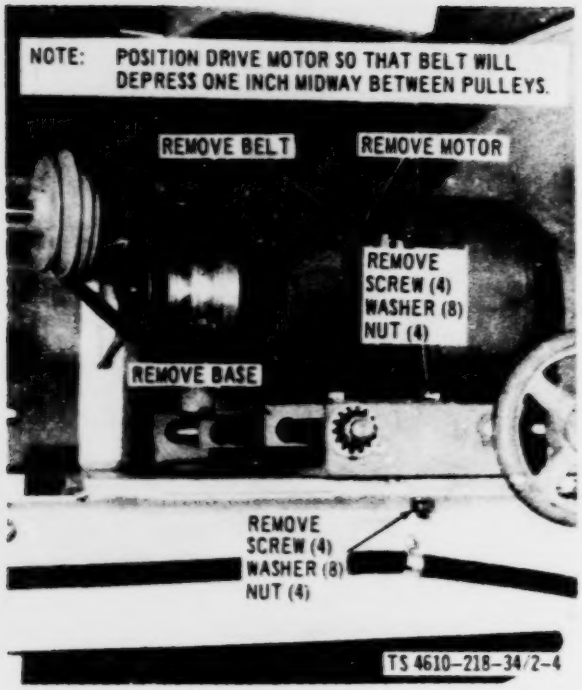


Figure 2-3. Erdlator Agitator Drive Motor Wiring, Removal and Installation

Figure 2-4. Erdlator Agitator Drive Motor, Removal and Installation

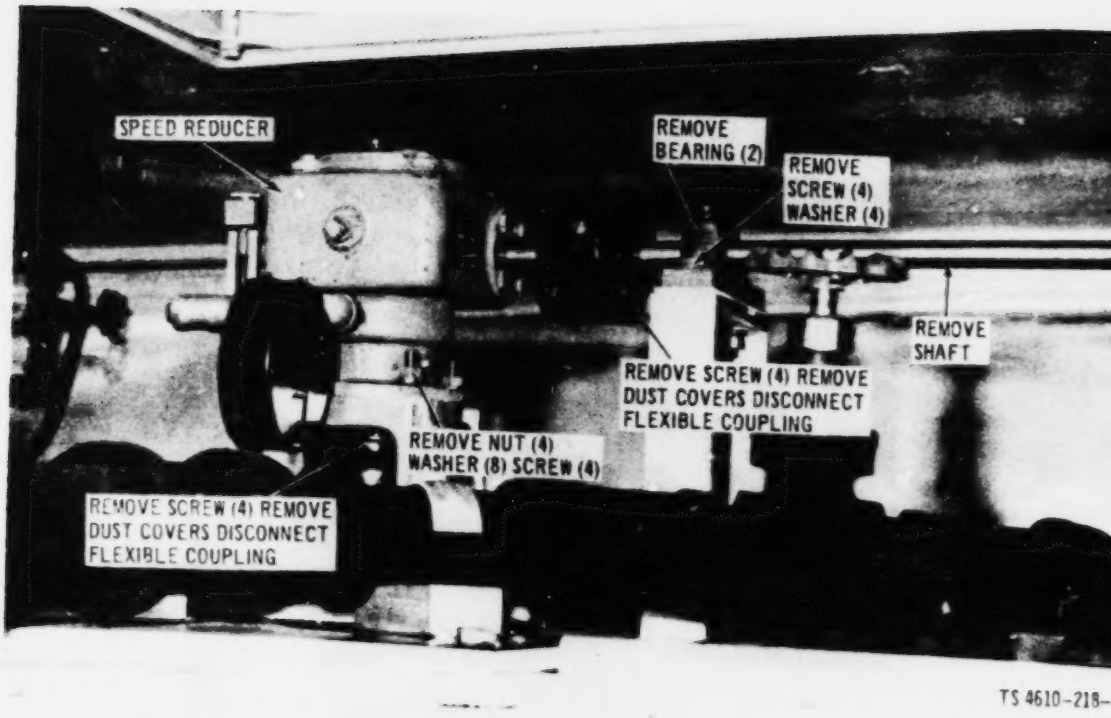

SPEED REDUCER
REMOVE BEARING (2)
REMOVE SCREW (4) WASHER (4)
REMOVE SHAFT
REMOVE SCREW (4) REMOVE DUST COVERS DISCONNECT FLEXIBLE COUPLING
REMOVE NUT (4) WASHER (8) SCREW (4)
REMOVE SCREW (4) REMOVE DUST COVERS DISCONNECT FLEXIBLE COUPLING
TS 4610-218-

Figure 2-5. Erdlator Agitator Drive Shaft and Speed Reducer Assembly, Removal and Installation

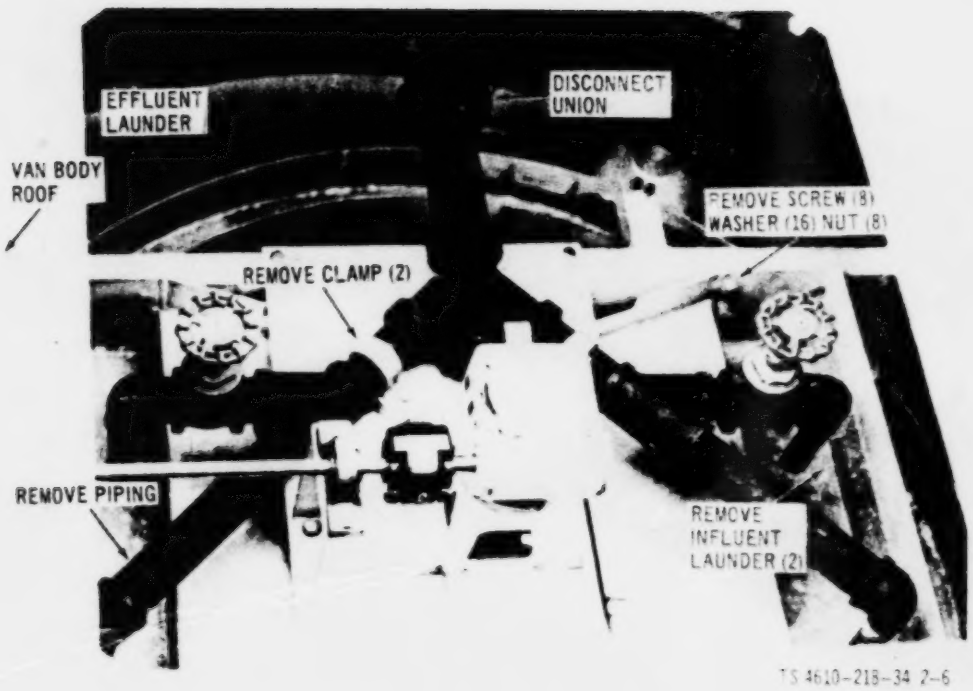


Figure 2-6. Aspirator Manifold Assembly, Removal and Installation

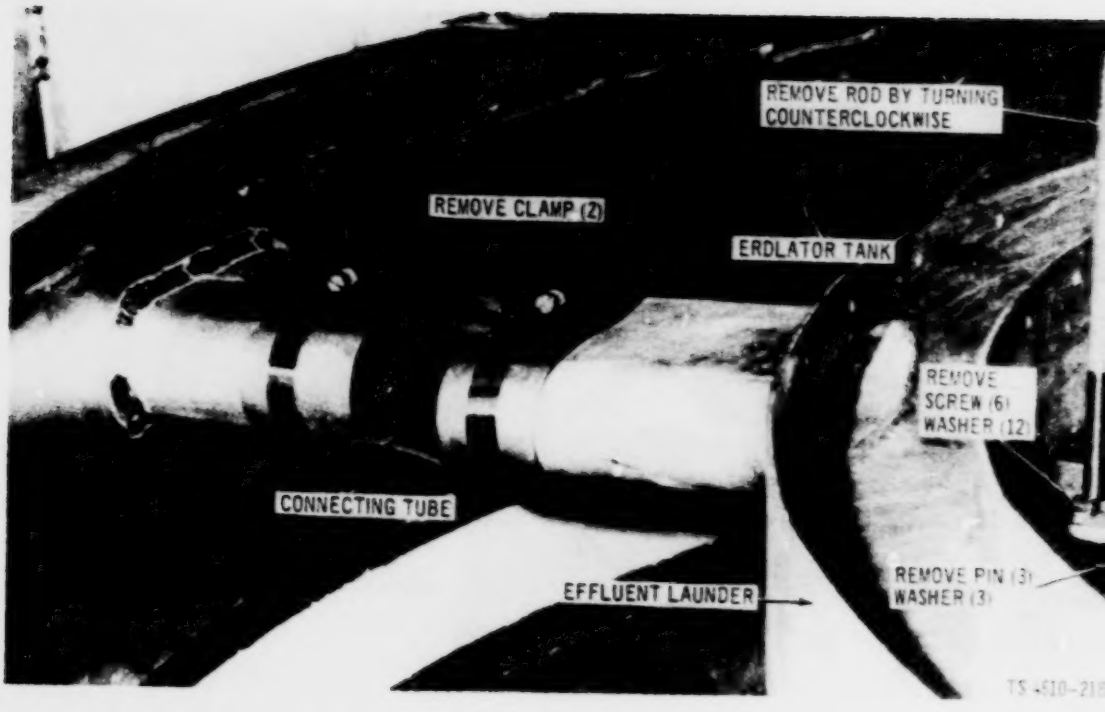


Figure 2-7. Effluent Launder Connecting Tube and Adjustable Support Rods, Removal and Installation

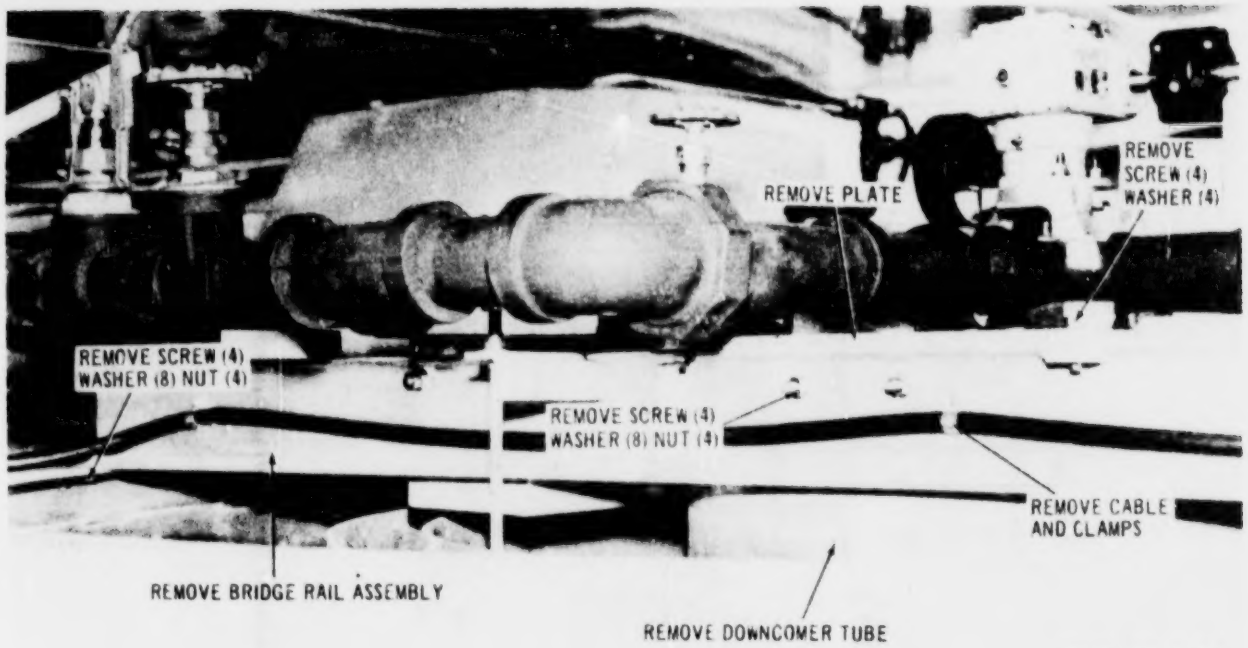

REMOVE PLATE
REMOVE SCREW (4) WASHER (4)
REMOVE SCREW (4) WASHER (8) NUT (4)
REMOVE SCREW (4) WASHER (8) NUT (4)
REMOVE CABLE AND CLAMPS
REMOVE BRIDGE RAIL ASSEMBLY
REMOVE DOWNCOMER TUBE
TS 4610-218-34 2-8

Figure 2-8. Speed Reducer Mounting Plate, Bridge Rail Assembly, and Downcomer Tube, Removal and Installation

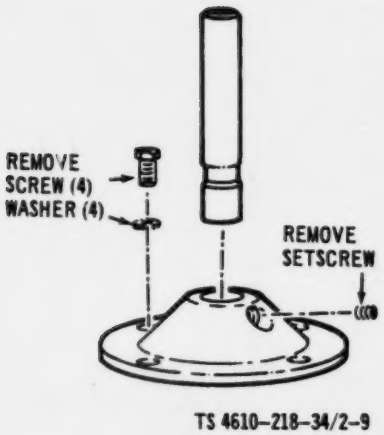


Figure 2-9. Erdlator Agitator Shaft Bearing Support, Removal and Installation

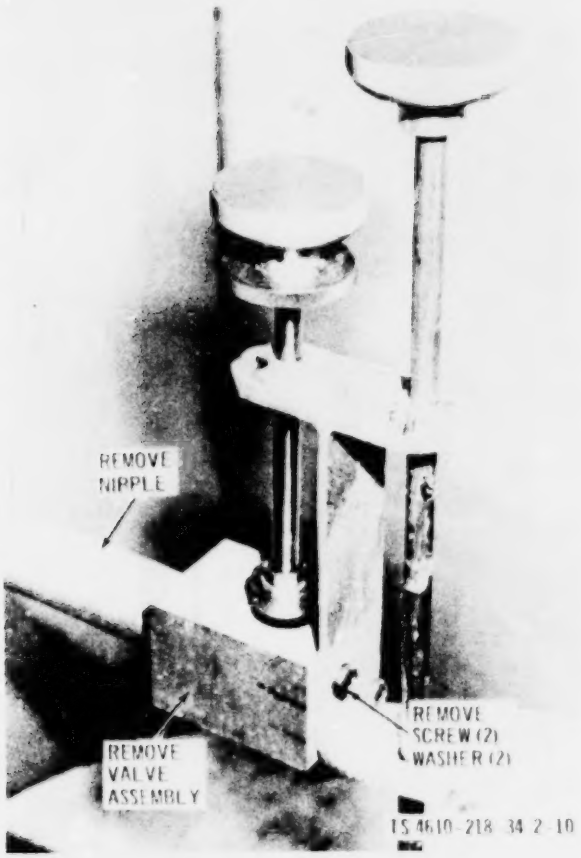


Figure 2-10. Sludge Concentrator Valves and Piping, Removal and Installation

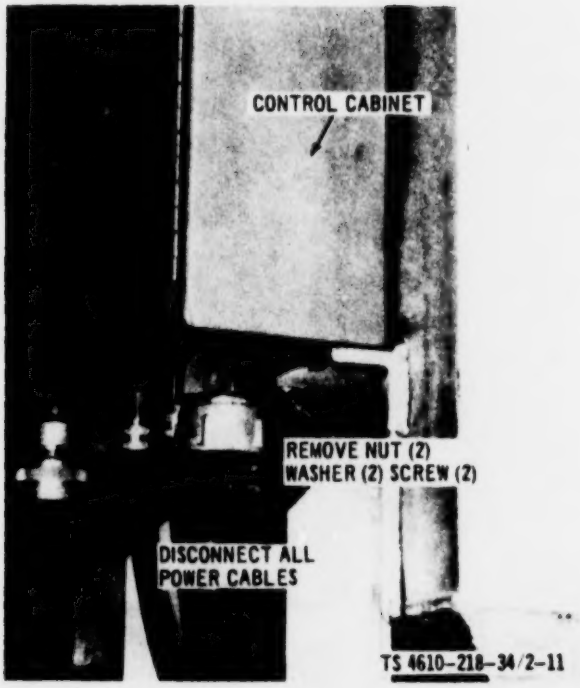


Figure 2-11. Electrical Control Cabinet, Removal and Installation

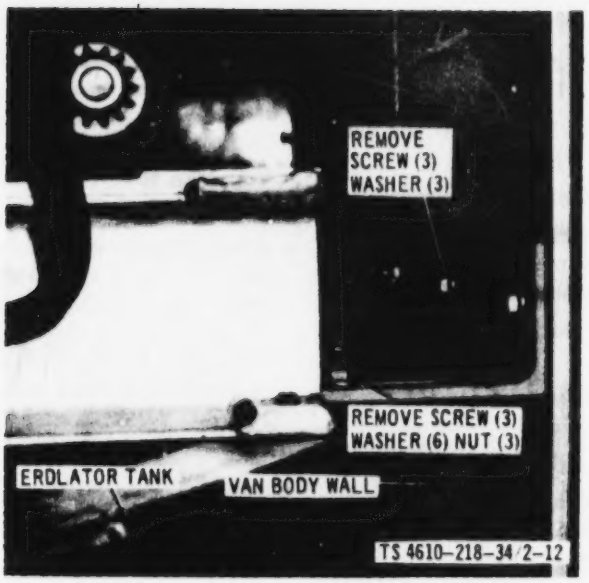


Figure 2-12. Erdlator Tank Top Mounting Bracket, Removal and Installation

Figure 2-13. Erdlator Tank Bottom Mounting, Removal and Installation

c. Installation.

(1) Position and install the erdlator tank in the van body (fig. 2-13 and 2-12).

(2) Refer to figure 2-11 and install the electrical control cabinet.

(3) Refer to figure 2-10 and install the sludge concentrator valves and piping.

(4) Refer to figure 2-9 and install the stub shaft in the bottom of the erdlator tank.

(5) Place the effluent launder in the erdlator tank.

(6) Lower the downcomer tube down through the van body roof hatch opening.

(7) Install the bridge rail assembly (fig. 2-8).

(8) Refer to figure 2-8 and install the nuts, washers, and screws that secure the downcomer tube to the bridge rail assembly.

(9) Lower the agitator shaft assembly down through the van body roof hatch opening.

(10) Refer to figure 2-8 and install the speed reducer mounting plate.

(11) Refer to figure 2-7 and install the effluent launder connecting tube and adjustable support rods.

(12) Refer to figure 2-6 and install the influent launder.

(13) Refer to figure 2-6 and install the aspirator manifold assembly.

(14) Refer to figure 2-5 and install the erdlator agitator speed reducer.

(15) Refer to figure 2-5 and install the erdlator agitator drive shaft.

(16) Refer to figures 2-4 and 2-3 and install the erdlator agitator drive motor.

(17) Position and connect all piping and tubing as required.

(18) Refer to figures 2-2 and 2-1 and install the low water level sensitive switch.

NOTE

The erdlator agitator shaft bearing support must be submerged in water before attempting to operate the unit.

2-8. Van Body.

a. General. The van body is attached to the truck chassis with capscrews and bolts. Wooden rails are used as a cushion between the van body and truck chassis. Lifting ring attachments are provided to attach the crane sling cables to the van body. The lifting ring attachments are located at the outboard front and rear of the two skid rails running fore and aft of the under side of the van body.

WARNING

Be sure the crane used has a capacity of at least 12 tons.

b. Removal.

(1) Disconnect and remove all electrical and fuel connections between the truck chassis and van body.

(2) Refer to figure 2-14 and attach the crane sling cables.

(3) Refer to figures 2-15, 2-16 and 2-17 and remove the van body off the truck chassis.

c. Installation.

(1) Lower van body on truck chassis, align holes with a drift pin.

NOTE

Be sure to position the wooden rails between the truck chassis and van body.

(2) Refer to figures 2-17, 2-16 and 2-15 and install all mounting hardware.

(3) Position and connect all electrical and fuel lines as required.

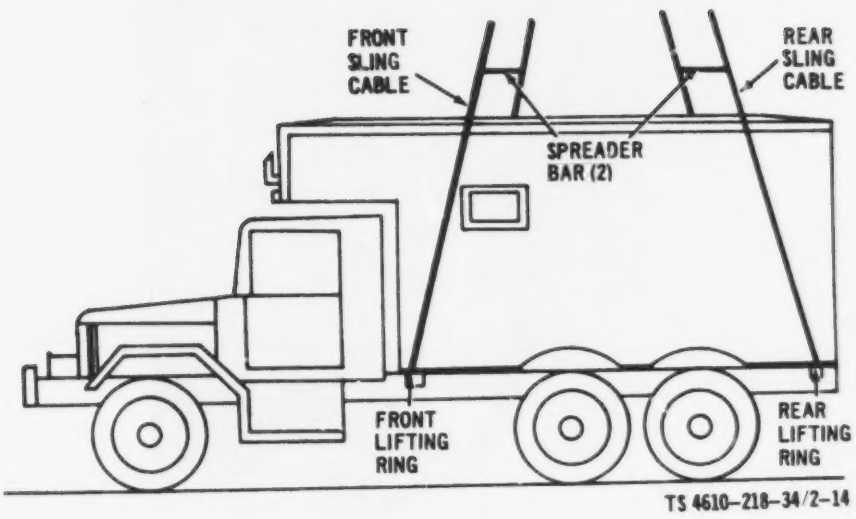


Figure 2-14. Lifting Van Body from Truck Chassis, Sling Points

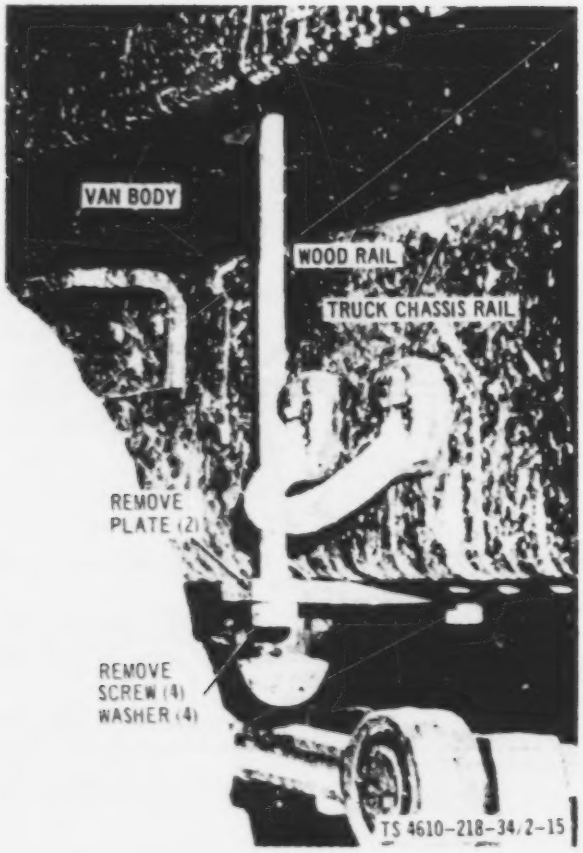


Figure 2-15. Van Body Mounting, Rear, Removal and Installation

Figure 2-16. Van Body Mounting, Center, Removal and Installation

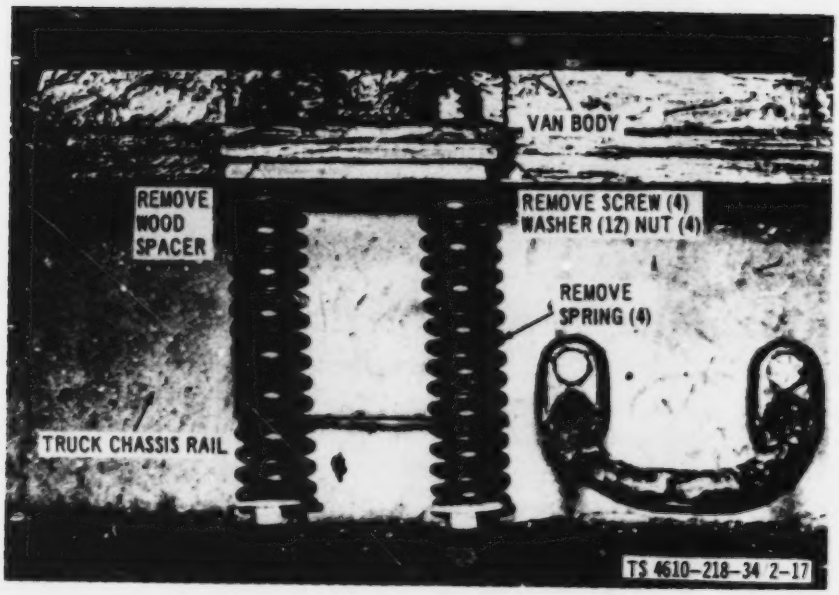


Figure 2-17. Van Body Mounting, Front, Removal and Installation

CHAPTER 3
REPAIR OF VAN BODY

Section I. VAN BODY ELECTRICAL SYSTEM

3-1. Van Body Electrical System.

a. General. The van body electrical system has two types of circuits. A 24-volt dc current powers the clearance lights on the exterior of the van body, personnel heater fuel pump, and receptacle connector, for the 24-volt extension light in the interior. The other circuit is a 110-volt ac current-type and is used to provide power to the van ceiling lights, heater thermostat, heater electrical system, and a receptacle connector for the 110-volt extension light. The 24-volt current is provided from the truck chassis wiring harness while the 110-volt current is provided through a circuit breaker located in the electrical control cabinet of the water treatment section. Always refer to wiring diagram FO 1 when installing replacement wiring to insure proper connections.

b. Repair or Replacement of Electrical Components.

(1) Remove the van body clearance lights as illustrated in figures 3-1 and 3-2.

(2) Remove the receptacle connector as illustrated in figures 3-3 and 3-4.

(3) Remove the heater thermostat as shown in figure 3-5.

(4) Remove the door blackout switches as shown in figure 3-6.

(5) Remove the ceiling light switches as illustrated in figure 3-7.

(6) Remove the ceiling lights as illustrated in figure 3-8.

WARNING

Be sure to disconnect the main power supply before repairing or replacing electrical connections.

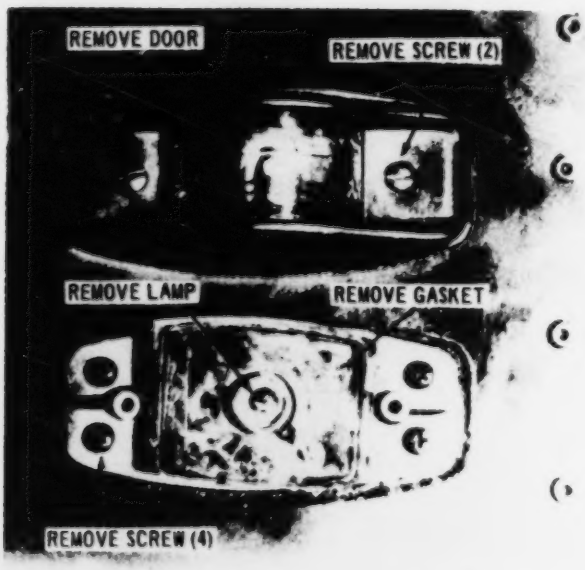


Figure 3-1. Van Clearance Lights, One with Door Removed, Removal and Installation

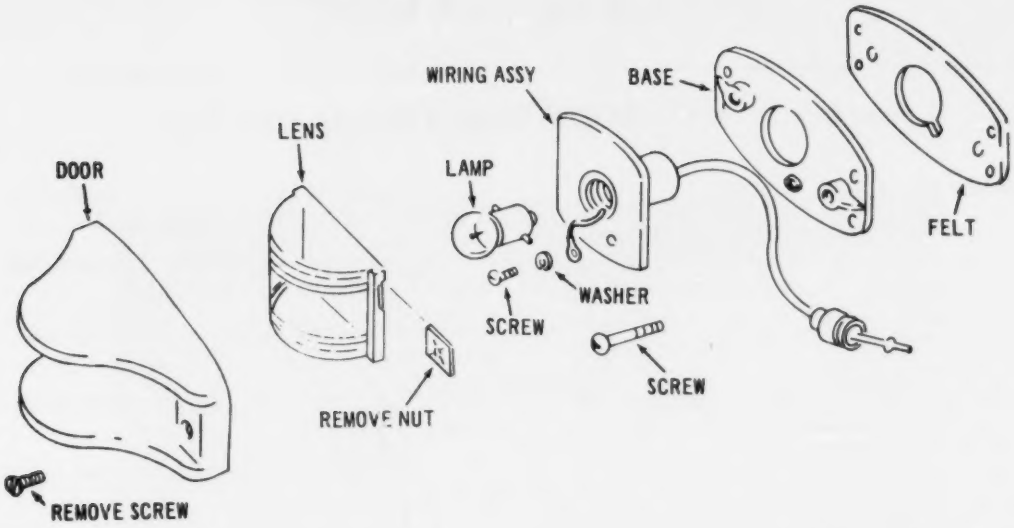


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Figure 3-2. Van Clearance Light, Disassembly and Reassembly

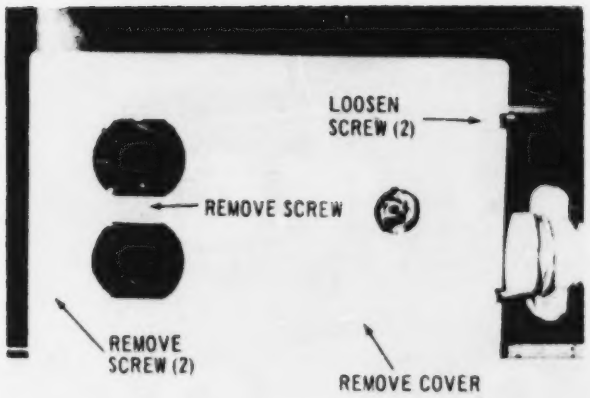

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Figure 3-3. Duplex Receptacle Connector, Removal and Installation

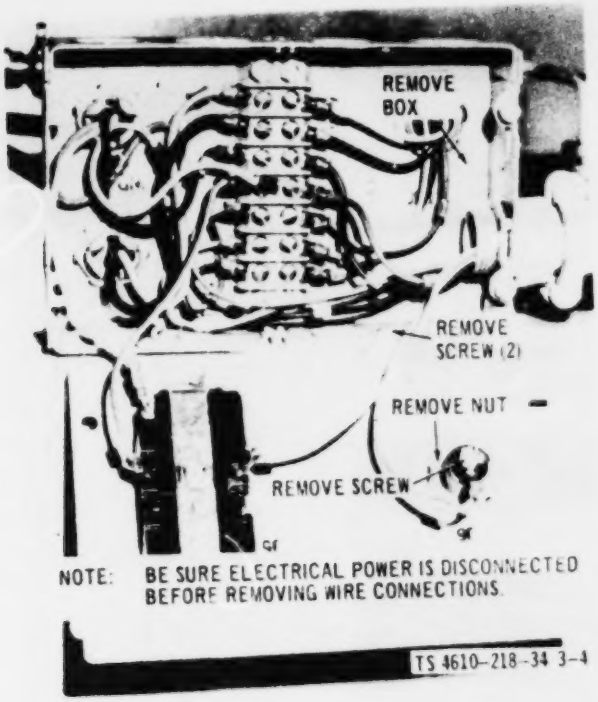


Figure 3-4. Duplex Receptacle Connector, with Cover Removed, Removal and Installation

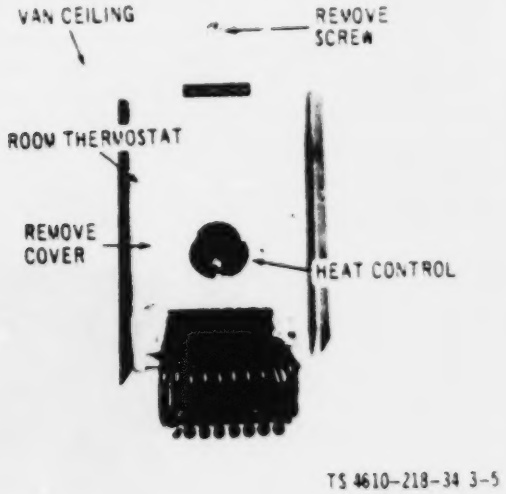
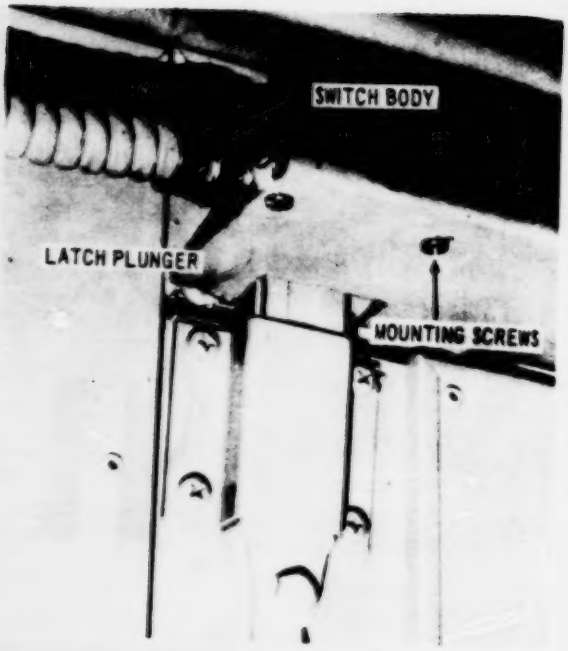


Figure 3-5. Heater Room Thermostat, Removal and Installation

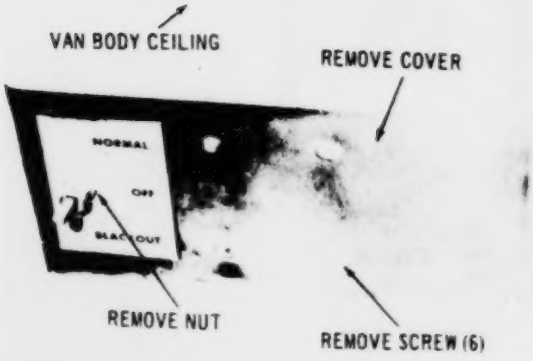


ADJUSTMENT

STEP 1. LOOSEN MOUNTING SCREWS.
STEP 2. CLOSE DOOR AND ENGAGE DOOR LATCH.
STEP 3. MOVE SWITCH BODY UNTIL SWITCH ROLLER MAKES CONTACT WITH DOOR LATCH PLUNGER AND ACTUATES SWITCH.

TS 4610-218-34 3-6

Figure 3-6. Door Blackout Switch, Removal, Installation, and Adjustment



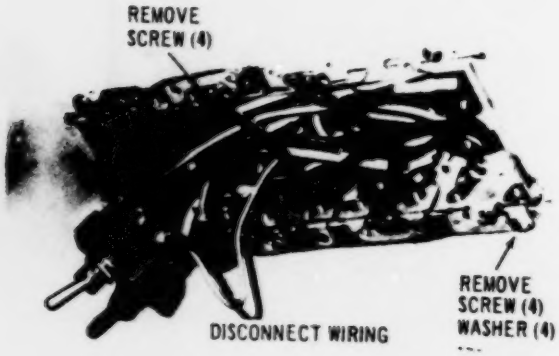


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Figure 3-7. Van Ceiling Light Toggle Switch, Removal and Installation

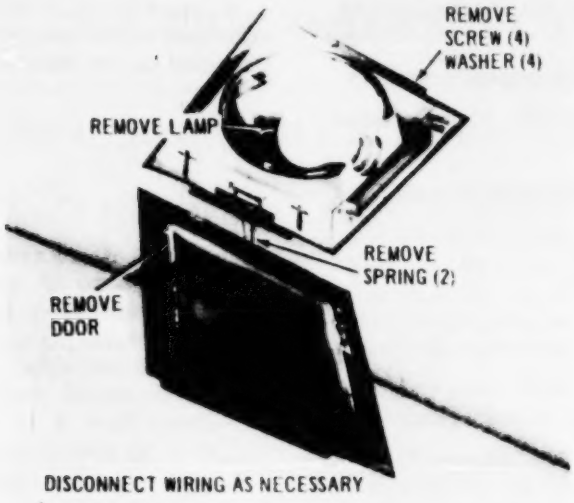


Figure 3-8. Van Body Ceiling Light, Removal and Installation

c. Repair or Replacement of Electrical Wiring. Repair of the 24-volt wiring is limited to those parts which are accessible without removal of wiring. Cable connectors which are attached to the clearance lights may be replaced by sliding back the rubber shell and plastic sleeve and removing the female or male terminal which is crimped on the wire. If the terminal does not need replacing, clean and straighten for good connection. Wiring of the 110-volt circuit is also concealed in the walls and ceiling, consequently, if replacement is required, it is necessary to remove body panels in a rebuild shop.

d. Installation.

(1) Install the ceiling lights as illustrated in figure 3-8.

(2) Install the ceiling light switches as illustrated in figure 3-7.

(3) Install the door blackout switches as shown in figure 3-6.

(4) Install the heater thermostat as shown in figure 3-5.

(5) Install the receptacle connector as illustrated in figures 3-4 and 3-3.

(6) Install the van body clearance lights as shown in figures 3-2 and 3-1.

Section II. VAN LADDER ASSEMBLY

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

3-2. Van Ladder Assembly.

a. General. Two ladder assemblies, of welded construction, are furnished with each van body. When not in use, the right side door ladder is stored on ladder hangers fastened to the inside surface of the right side door.

b. Removal. Remove the rear door ladder from the van body and remove the right side door ladder from the ladder hangers on the van door.

c. Clean, Inspect and Repair.

(1) Clean the ladder with dry cleaning solvent P-D-680.

(2) Inspect the ladder for cracks, breaks, and distortion.

(3) Straighten bends and twisted members.

(4) Weld breaks and cracks. Paint welded spots and damaged paint.

d. Installation. Position and secure the side door ladder assembly on the ladder h provided on the right side van body door.

CHAPTER 4
REPAIR OF ERDLATOR ASSEMBLY COMPONENTS

Section I. RAW WATER FLOW INDICATOR

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

4-1. Raw Water Flow Indicator.

a. General. The raw water flow indicator is located in the raw water-line between the inlet hose and the top of the erdlator tank. It indicates, in gallons per minute, the amount of raw water being pumped to the erdlator tank.

b. Removal. Remove the raw water flow indicator as illustrated in figure 4-1.

c. Disassembly. Disassemble the raw water flow indicator as illustrated in figure 4-2.

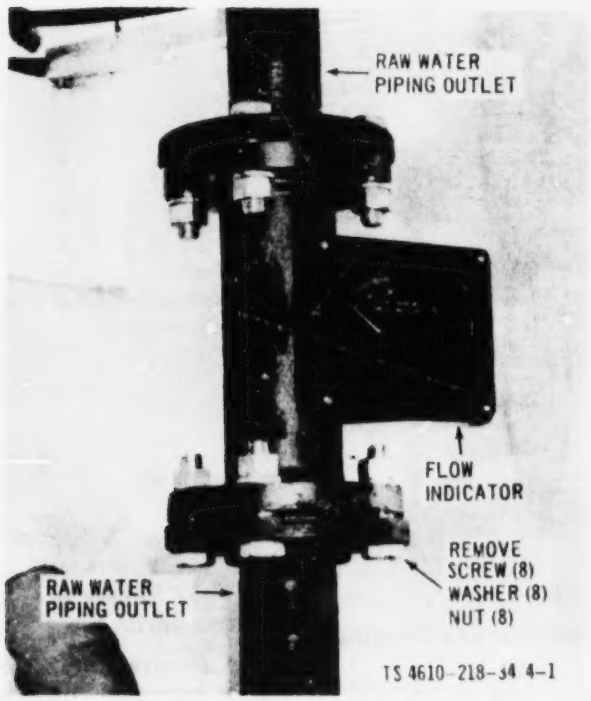


Figure 4-1. Raw Water Flow Indicator and Piping, Removal and Installation

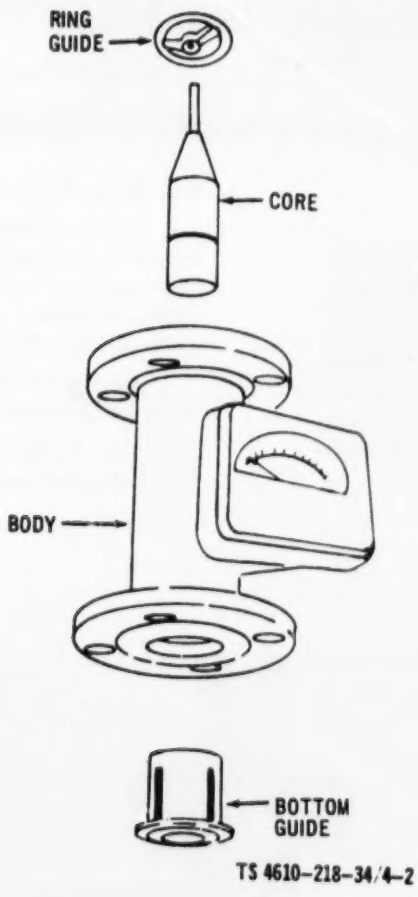


Figure 4-2. Raw Water Flow Indicator, Disassembly and Reassembly

d. Clean, Inspect and Repair.

(1) Clean all metal parts with dry cleaning solvent P-D-680.

(2) Clean the glass cover with a soft clean cloth and water.

(3) Inspect the head and case for cracks and damage.

(4) Inspect the scale plate and cover for scratches and discoloration.

(5) Repair or replace all damaged or d fective parts.

e. Reassembly. Reassembly of the raw wat flow indicator is the reverse of the disassemb procedure as described in figure 4-2.

f. Installation. Install the raw water flow i dicator as directed in figure 4-1.

Section II. ERDLATOR AGITATOR SPEED REDUCER

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

4-2. Erdlator Agitator Speed Reducer.

a. General. The speed reducer is located on top of the erdlator tank on the bridge rail assembly above the erdlator agitator. It reduces the speed from the electric motor to the erdlator agitator.

b. Removal. Removal of the agitator speed reducer is illustrated in figure 4-3.

c. Disassembly. Disassemble the agitator speed reducer as directed in figure 4-4.

NOTE

Retain the entire flexible coupling if a replacement speed reducer is to be installed.

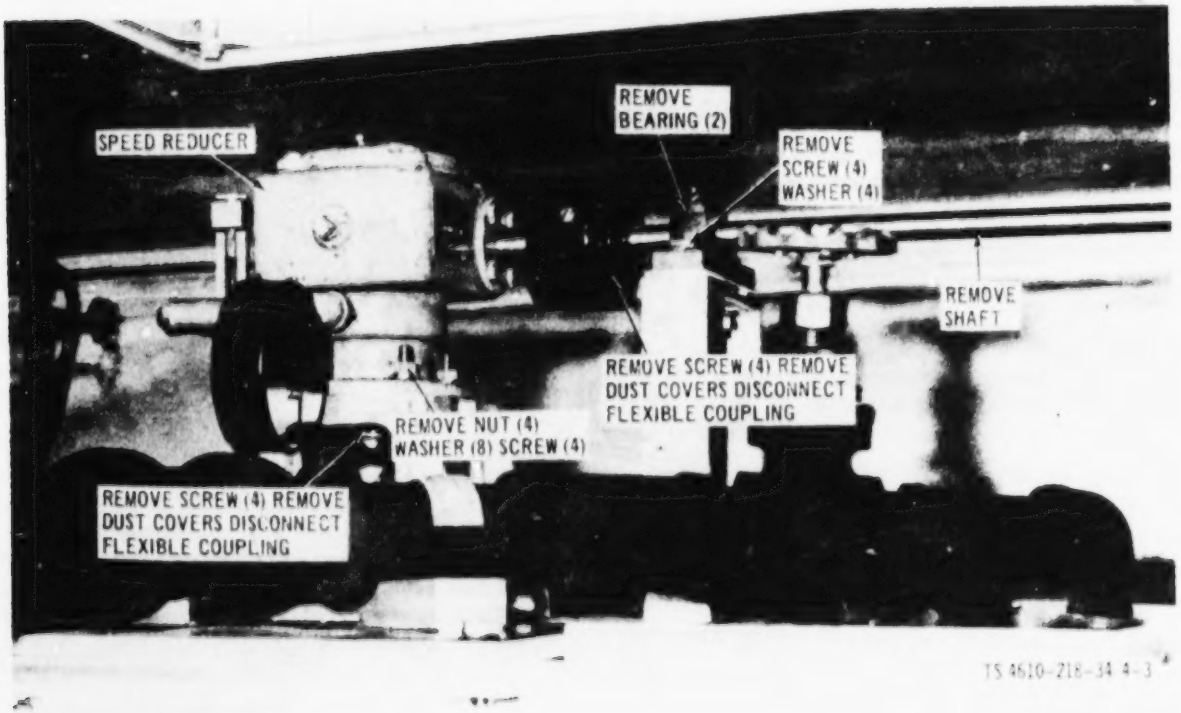

SPEED REDUCER
REMOVE BEARING (2)
REMOVE SCREW (4) WASHER (4)
REMOVE SHAFT
REMOVE SCREW (4) REMOVE DUST COVERS DISCONNECT FLEXIBLE COUPLING
REMOVE NUT (4) WASHER (8) SCREW (4)
REMOVE SCREW (4) REMOVE DUST COVERS DISCONNECT FLEXIBLE COUPLING
TS 4610-218-34 4-3

Figure 4-3. Erdlator Agitator Drive Shaft and Speed Reducer Assembly, Removal and Installation

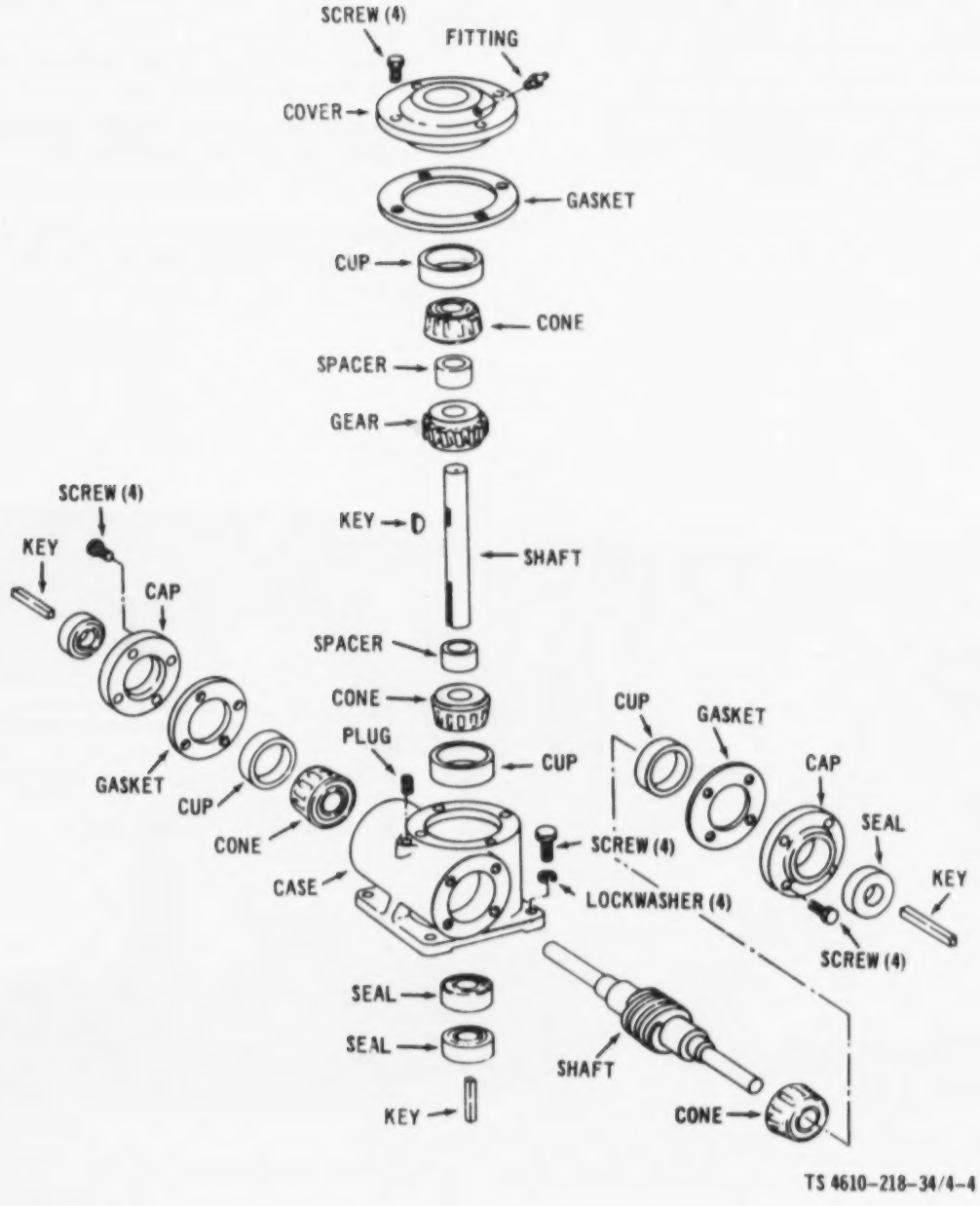


Figure 4-4. Erdlator Agitator Speed Reducer, Disassembly and Reassembly

d. Clean, Inspect and Repair.

(1) Clean the speed reducer with dry cleaning solvent P-D-680.

(2) Inspect the input and output shaft seals for wear, deterioration, bent or distorted casings and other damage.

(3) Inspect the bearings for corroded or pitted surfaces and wear. Revolve the bearings by hand and check for rough spots.

(4) If the seals and bearings are in serviceable condition, cover them with a thin coat of light oil and wrap them in a lint-free cloth or waxed paper.

(5) Inspect the gear and worm for cracked or broken teeth and worn keyways.

(6) Inspect the shaft for damaged threads, worn keyways, misalignment, and cracks.

(7) Inspect the housing, side cover, and bearing adapter for cracks and other damage.

(8) Replace all unserviceable parts.

e. Reassembly. Reassembly of the agitator speed reducer is the reverse of the disassembly process as described in figure 4-4.

f. Installation. Install the agitator speed reducer as shown in figure 4-3.

Section III. ERDLATOR AGITATOR SHAFT ASSEMBLY

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

4-3. Erdlator Agitator Shaft Assembly.

a. General. The erdlator agitator shaft assembly consists of a tubular shaft with five disks attached (fig. 1-4). A hub is riveted to each disk and the hubs are fastened to the shaft with headless pins. A rubber sleeve bearing in the lower end of the shaft is held in palce by two setscrews. The shaft has holes drilled in it to allow the water to circulate and cool the rubber bearing. The agitator bearing support is mounted to the bottom of the erdlator tank and the stub shaft is secured in the bearing support with a setscrew. The stub shaft supports the lower end of the agitator shaft assembly and keeps the agitator disks and shaft centered in the erdlator downcomer tube.

b. Removal.

WARNING

Be sure to disconnect the main power supply before proceeding with the following steps.

(1) Disconnect the electrical connections from the erdlator agitator drive motor as illustrated in figure 4-5.

(2) Remove the electrical cable clamps securing cables to the bridge rail assembly.

(3) Remove the effluent launder connecting tube and adjustable support rods from the bridge rail assembly as illustrated in figure 4-6.

(4) Refer to figure 4-7 and remove the nuts, washers, and screws that secure the downcomer tube to the bridge rail assembly.

(5) Refer to figure 4-8 to disconnect the union connecting the aspirator manifold assembly to the raw water piping.

(6) Remove the dust cover of the flexible coupling shown in figure 4-8, and remove the chain to disconnect the two halves of the flexible coupling.

(7) Lift the bridge rail assembly (with attached drive components) up and away from the erdlator tank.

(8) Lift the erdlator agitator shaft up through the van body roof hatch opening.

(9) Lift the downcomer tube up through the van body roof hatch opening.

(10) Refer to figure 4-9 and remove the erdlator agitator shaft bearing support.

c. Disassembly. Refer to figure 4-10 and disassemble the agitator shaft and disks.

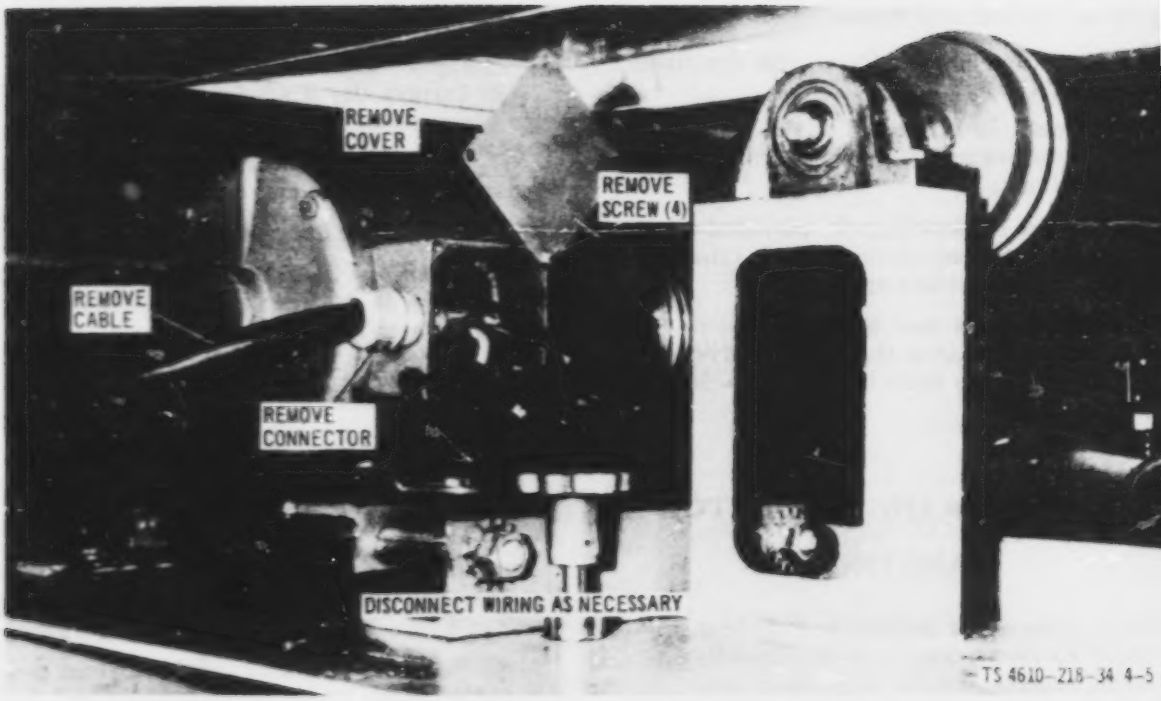


Figure 4-5. Erdlator Agitator Drive Motor Wiring, Removal and Installation

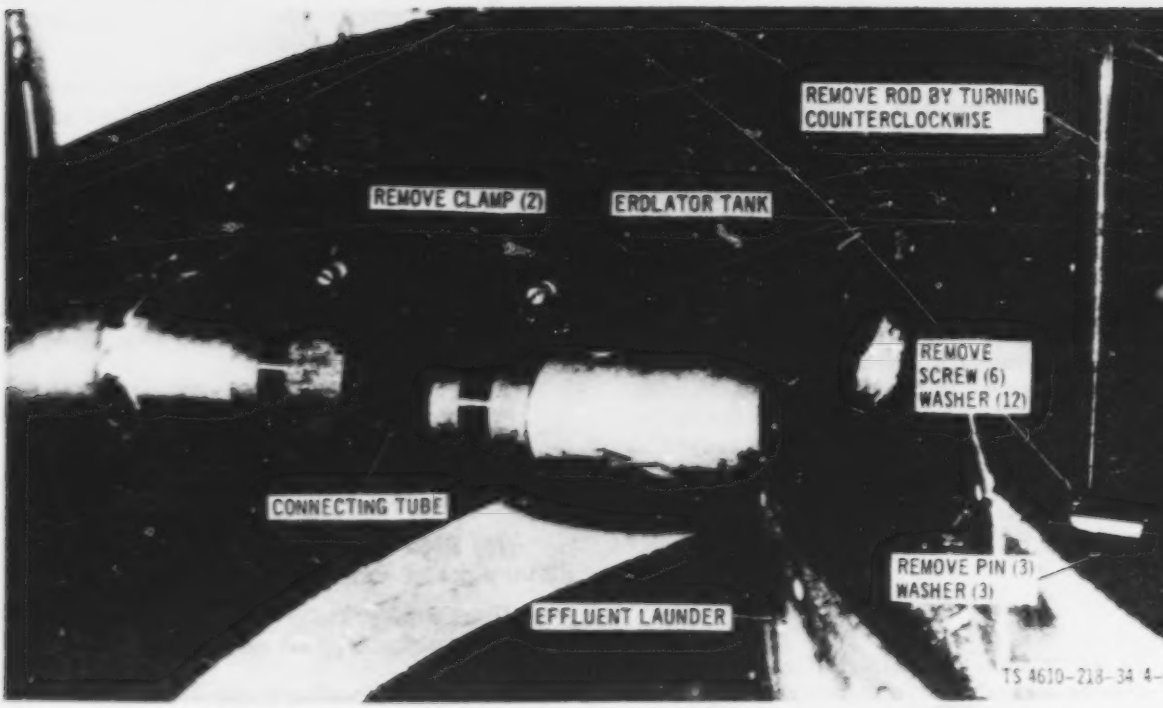


Figure 4-6. Effluent Launder Connecting Tube and Adjustable Support Rods, Removal and Installation

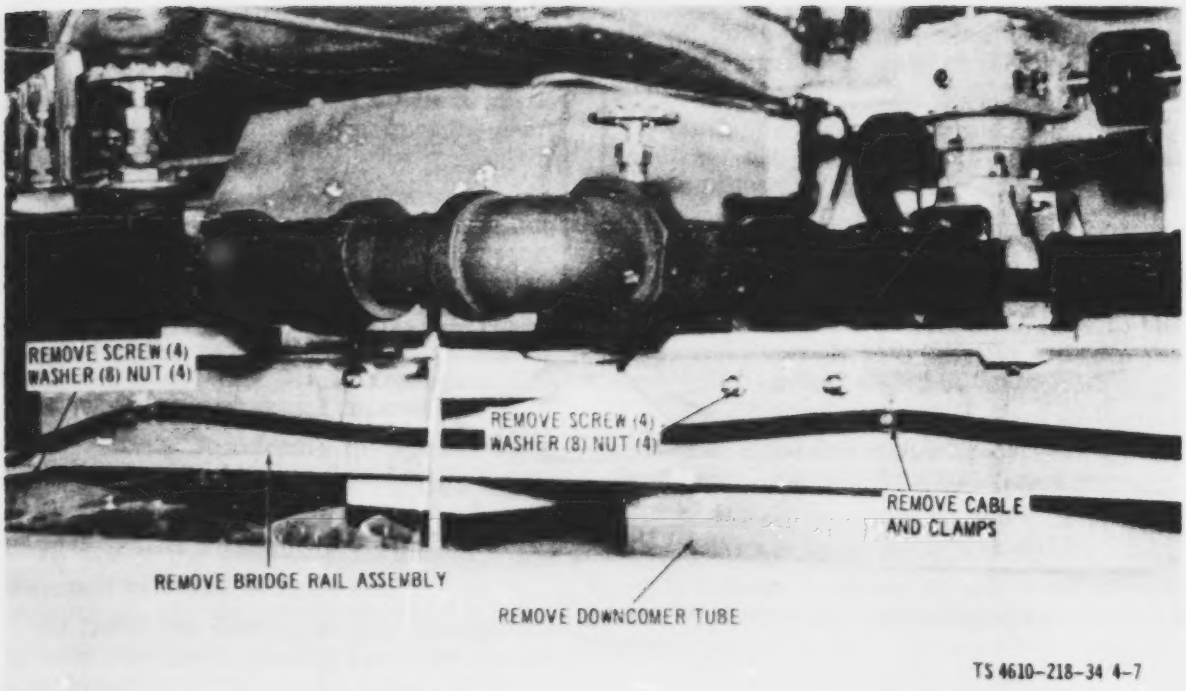


Figure 4-7. Bridge Rail Assembly, Removal and Installation

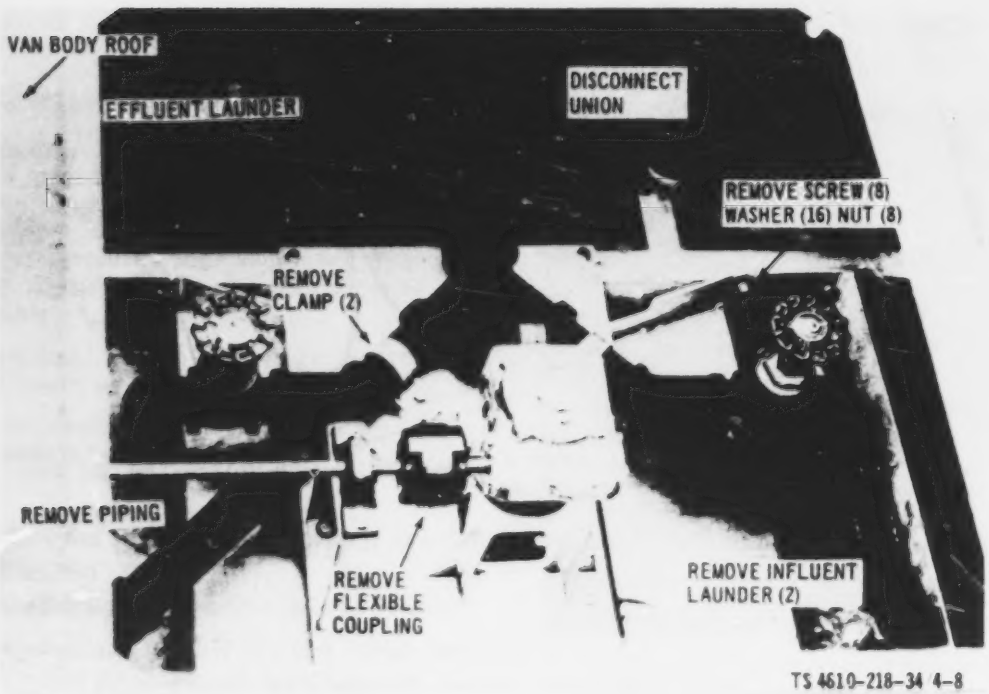


Figure 4-8. Aspirator Manifold Assembly and Flexible Coupling, Removal and Installation

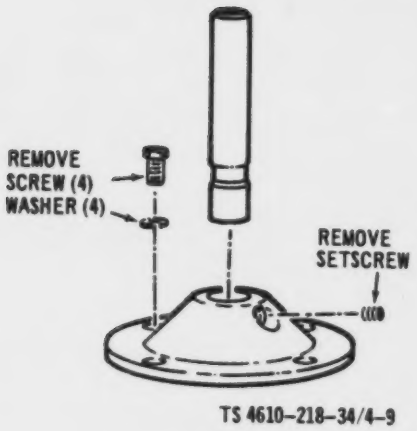


Figure 4-9. Erdlator Agitator Shaft Bearing Support, Removal and Installation

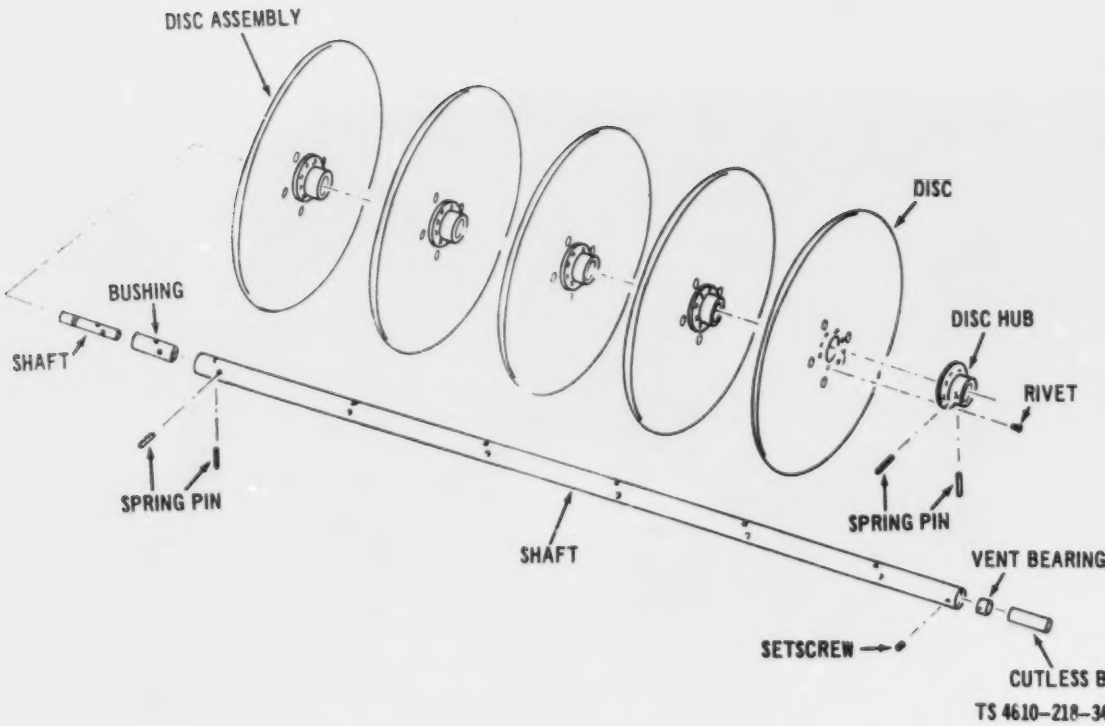


Figure 4-10. Erdlator Agitator Shaft Assembly, Disassembly and Reassembly

d. Clean, Inspect and Repair.

(1) Clean all parts with dry cleaning solvent P-D-680. If necessary, use a wire brush to remove rust or foreign matter from the shaft bearing support.

(2) Inspect the stub shaft and shaft bearing support for cracks, an excessively worn stub shaft, stripped or damages threads, and other damage.

(3) Replace all unserviceable parts. Inspect the parts of the agitator shaft and disks for cracks and distortion. Straighten minor distortion or replace if otherwise unserviceable.

e. Reassembly. Reassemble the agitator shaft bearing support as shown in figure 4-9.

f. Installation.

(1) Install the erdlator agitator shaft bearing support as shown in figure 4-9.

(2) Lower the downcomer tube through the van body roof hatch opening down into the erdlator tank.

(3) Lower the agitator shaft through the van body roof hatch opening and position it inside the downcomer tube.

(4) Position the bridge rail assembly (with attached drive components) on the erdlator tank.

(5) Connect the two halves of the flexible coupling with the chain and install the dust cover as shown in figure 4-8.

(6) Connect the aspirator manifold assembly to the raw water piping at the union, figure 4-8.

(7) Secure the downcomer tube to the bridge rail assembly with the nuts, washers, and screws at the points shown in figure 4-7.

(8) Install the effluent launder connecting tube and adjustable support rods as shown in figure 4-6.

(9) Install the electrical cable clamps and secure cables to the bridge rail assembly.

(10) Refer to figure 4-5 and make all electrical connections to the erdlator agitator drive motor.

NOTE

The erdlator agitator shaft bearing support must be submerged in water before attempting to operate the unit.

Section IV. LOW WATER LEVEL WARNING BUZZER

4-4. Low Water Level Warning Buzzer.

a. General. The low water level warning buzzer is mounted in the upper right corner of the electrical control cabinet. It is connected to the step-down transformer. The buzzer requires alternating current of the voltage and frequency specified on the unit. Do not connect it to any other circuit.

b. Removal. Remove the low water level warning buzzer as shown in figure 4-11.

c. Clean, Inspect and Replace.

(1) Clean the buzzer with a clean dry cloth.

(2) Test the buzzer by connecting it to a circuit of the correct voltage.

(3) Replace the buzzer if it fails to operate.

d. Installation. Install the low water level warning buzzer as illustrated in figure 4-11.

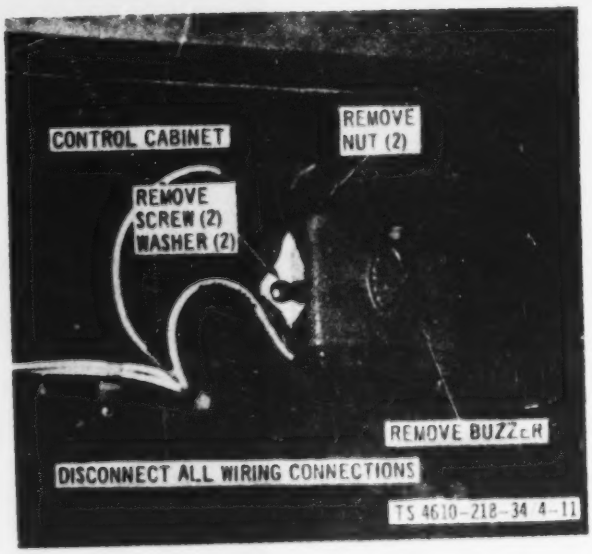


Figure 4-11. Low Water Level Warning Buzzer, Removal and Installation

Section V. ELECTRICAL CONTROL CABINET

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

4-5. Electrical Control Cabinet.

a. General. The electrical control cabinet is mounted to the front of the sludge concentrator tank. It contains the circuit breakers, motor starters, ON and OFF switches, transformer, low water alarm toggle switch, alarm buzzer, and warning light indicator. Wiring contained in the control cabinet consists of branched harness type, with individual wire code, size and component designation. When replacing individual wires or harness, always replace the same type and size as being removed. Always refer to wiring diagram FO 2 when installing replacement wiring to insure proper connections.

WARNING

Be certain that the power supply lines are disconnected before performing any maintenance operations on the electric wiring.

b. Removal as a Unit. Remove the electrical control cabinet as illustrated in figure 4-12.

c. Clean, Inspect and Replace.

(1) Clean the electrical control cabinet with dry cleaning solvent P-D-680.

(2) Inspect the cabinet for cracks, breaks, dents, and other damage.

(3) Straighten minor dents and bends, weld small cracks and breaks, paint welded spots and damaged paint.

(4) Replace the cabinet if it is beyond repair.

d. Installation as a Unit. Refer to figure 4-12 and install the electrical control cabinet.

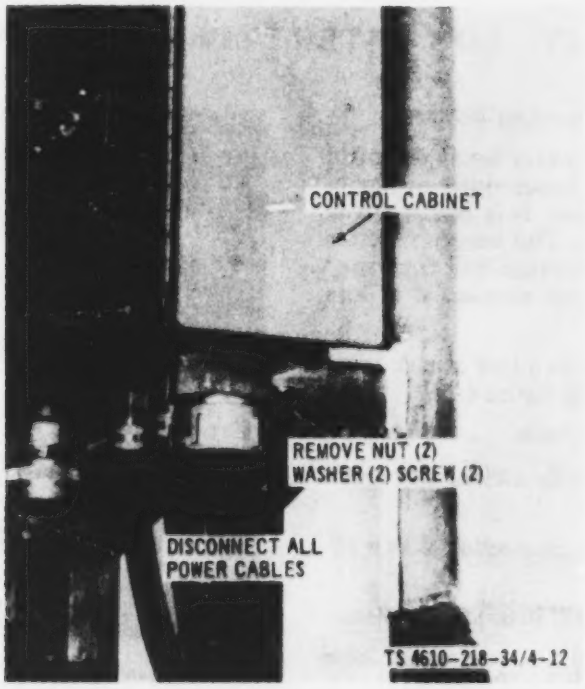


Figure 4-12. Electrical Control Cabinet, Removal and Installation

CHAPTER 5
REPAIR OF CHEMICAL FEED EQUIPMENT

Section I. CHEMICAL SLURRY FEEDER

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

5-1. Chemical Slurry Feeder.

a. General. The chemical slurry feeder consists of an aluminum tank divided into two equal watertight compartments. The two compartments are covered with one hinged cover. Each compartment has four agitators with two measuring cups attached to diametrically opposite agitators, a clear plastic window, drain outlets, collecting funnel, filling connections, and rate of discharge controller. The chemical slurry feeder agitators operate from a common shaft and rotate vertically. Each compartment functions as a separate unit, permitting two different chemical solutions to be fed at the same time. The chemical slurry feeder supplies limestone slurry to the erdlator tank and diatomite slurry to the diatomite dilution tank.

b. Removal.

(1) Remove the raw water piping as shown in figure 5-1.

(2) Remove the filtered water piping as illustrated in figure 5-2.

(3) Refer to figure 5-3 and remove the chain guard, remove the chain and chain tightener as illustrated in figure 5-4.

(4) Remove the slip clutch as illustrated in figure 5-5.

(5) Refer to figure 5-6 for removal of tubing between the dilution tank and erdlator tank.

(6) Remove all other parts as necessary.

(7) Refer to figure 5-7 and remove the chemical slurry feeder tank as illustrated.

(8) Refer to figure 5-8 and remove the slurry feeder agitators as illustrated.

c. Disassembly.

(1) Procedures for disassembly of the slurry feeder agitators are illustrated in figure 5-9.

(2) Refer to figure 5-10 and disassemble the slurry feeder shaft, seals and bearings.

(3) Refer to figure 5-11 and disassemble the slurry feeder housing.

d. Clean, Inspect and Repair.

(1) Wash all parts in dry cleaning solvent P-D-680 and dry thoroughly.

(2) Inspect for cracks, breaks, wear, distortion, and corrosion.

(3) Repair or replace all damaged or defective parts.

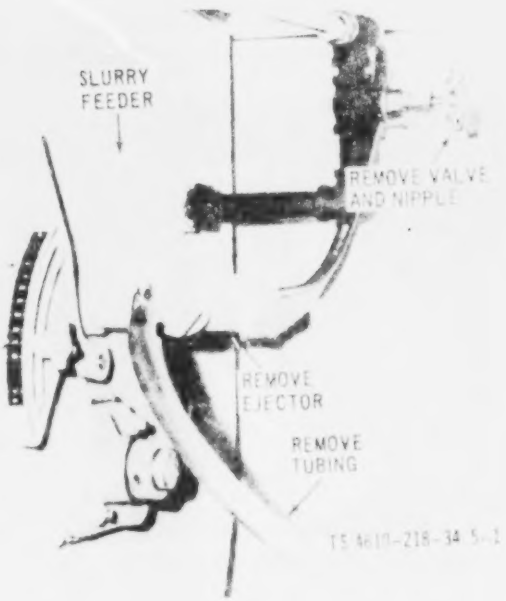


Figure 5-1. Slurry Feeder Raw Water Piping, Removal and Installation

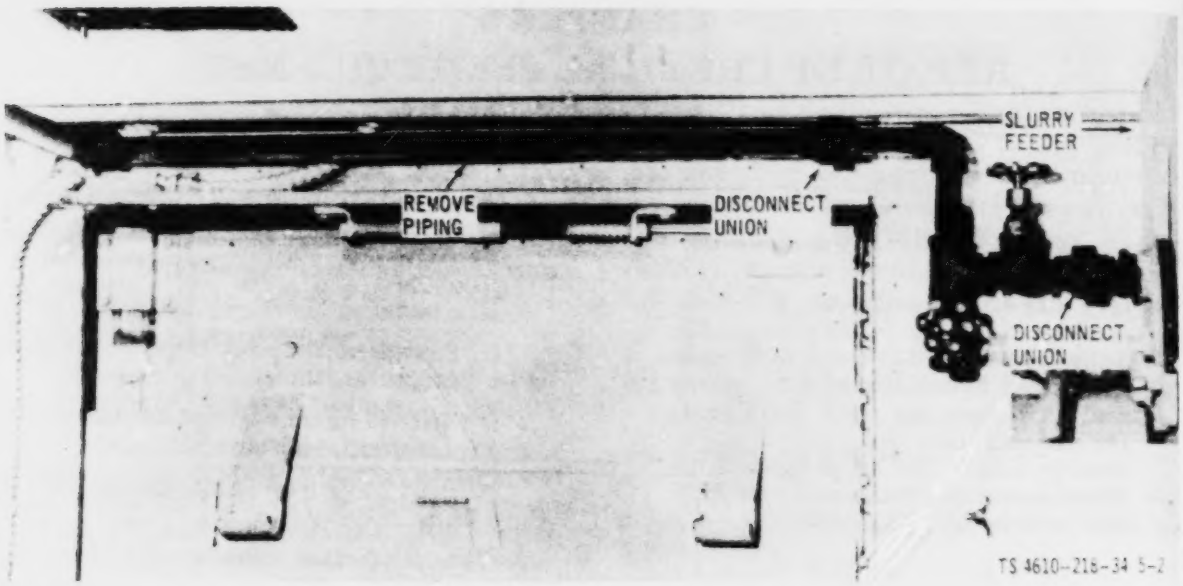


Figure 5-2. Piping Between the Main Filtered Water Lines and Slurry Feeder, Removal and Installation

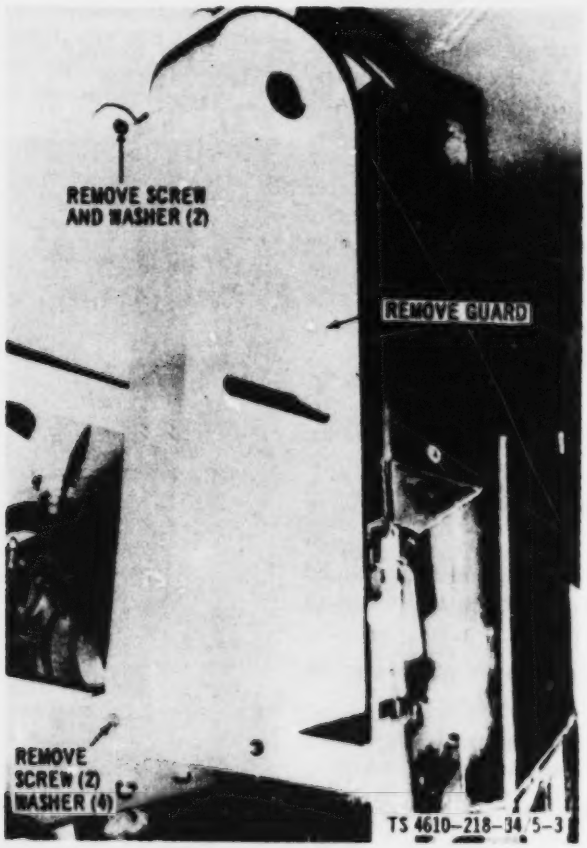


Figure 5-3. Chain Guard, Removal and Installation

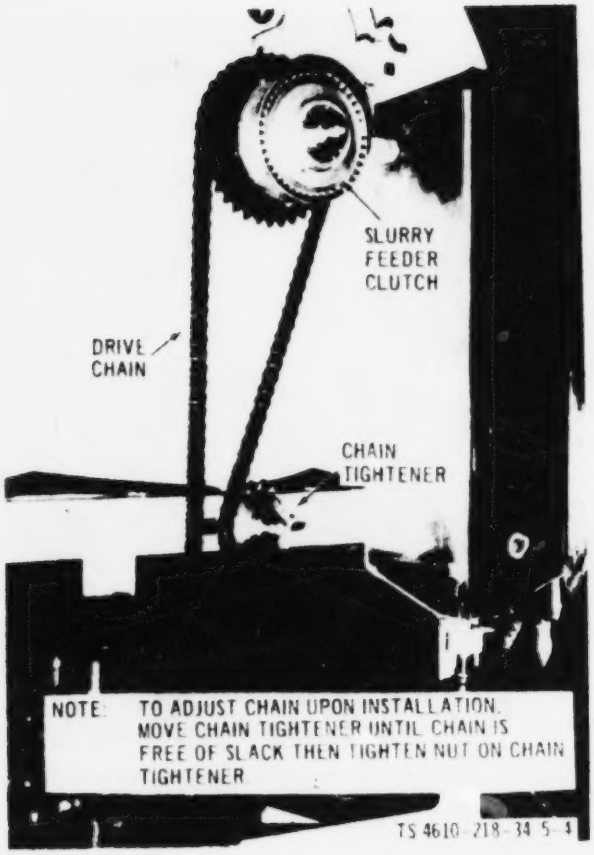
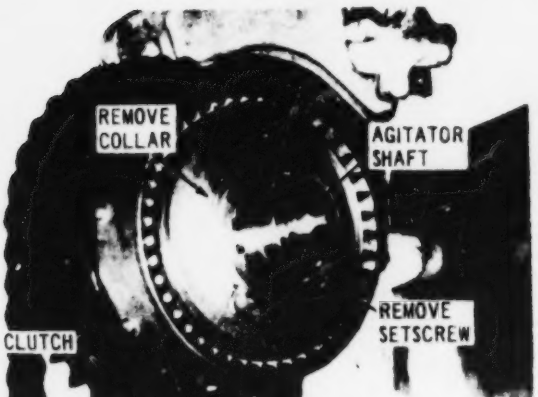
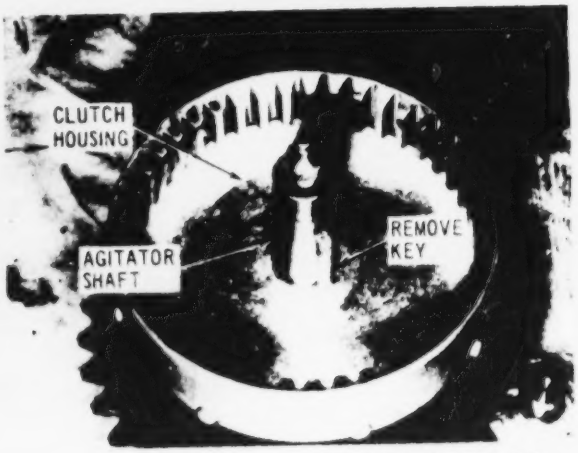


Figure 5-4. Chemical Slury Feeder Chain and Chain Tightener, Removal and Installation



NOTE: REMOVE CLUTCH FROM SHAFT BY PULLING STRAIGHT OUT.

STEP 1. REMOVE CLUTCH



NOTE: REMOVE CLUTCH HOUSING BY PULLING STRAIGHT OUT.

STEP 2. REMOVE CLUTCH HOUSING

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Figure 5-5. Slurry Feeder Slip Clutch, Removal and Installation

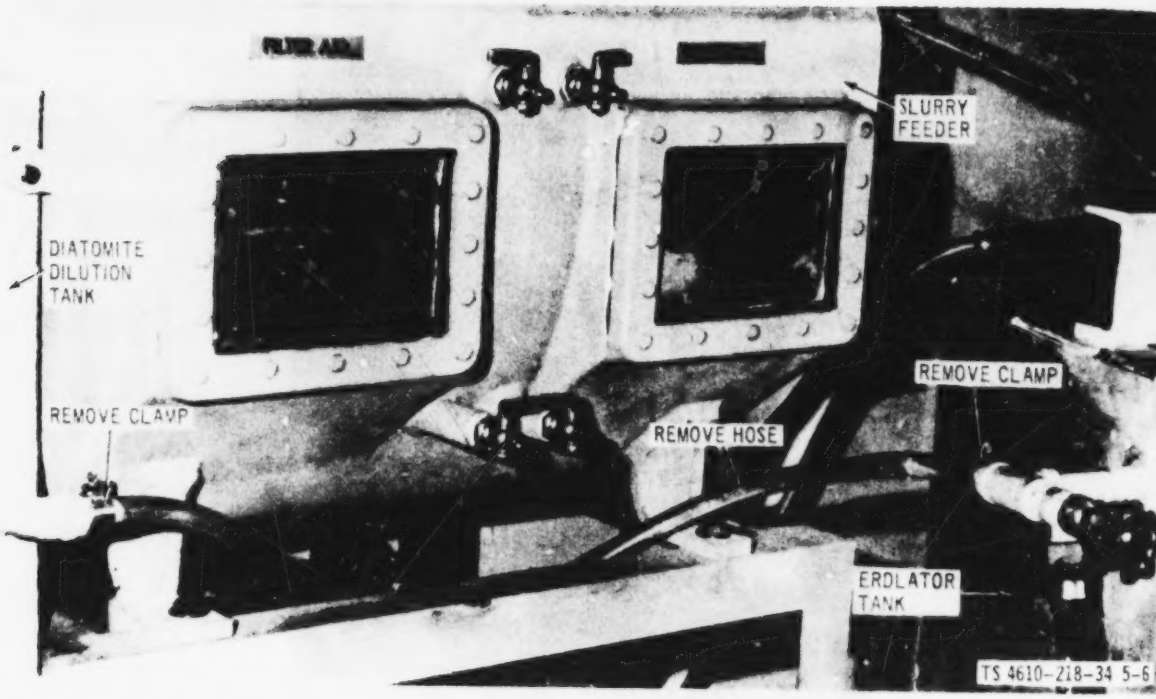


Figure 5-6. Erdlator Coagulated Water Tubing Between Erdlator Tank and Diatomite Dilution Tank. Removal and Installation

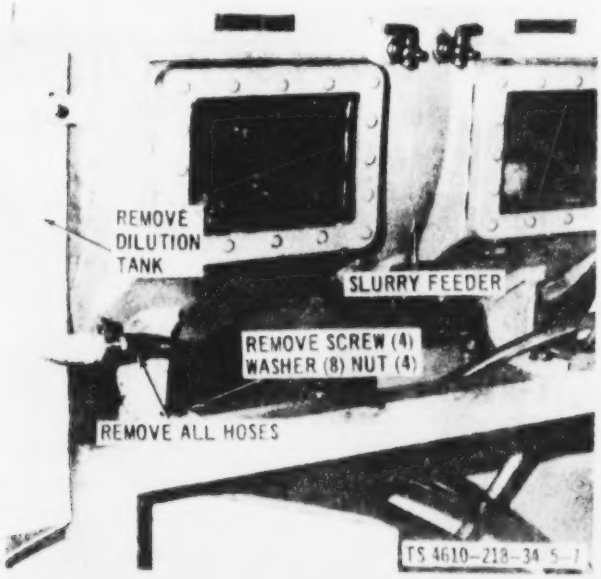


Figure 5-7. Chemical Slurry Feeder, Removal and Installation

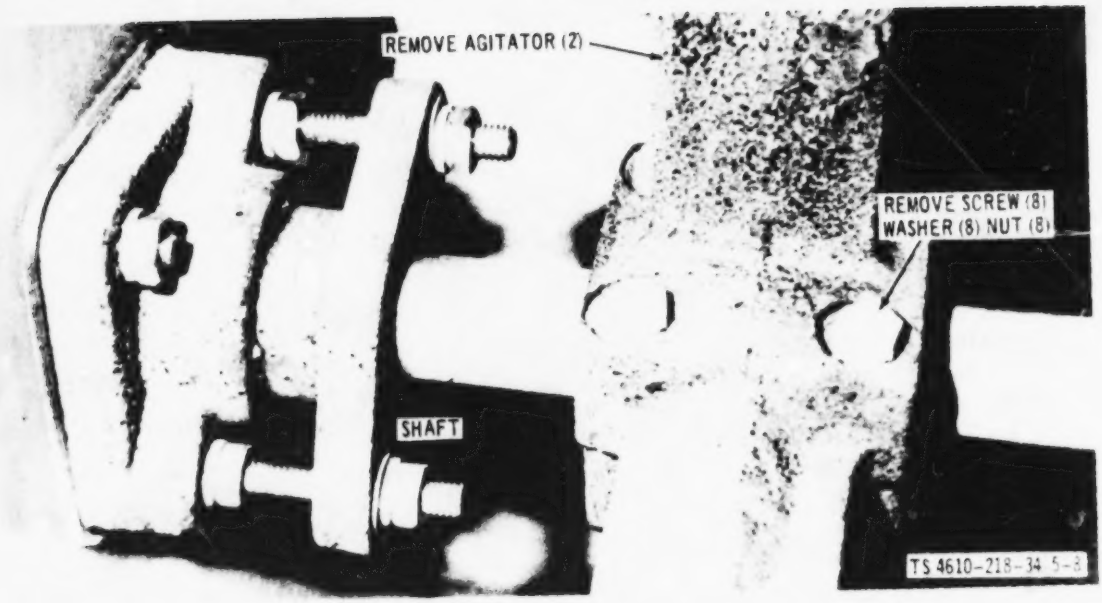


Figure 5-8. Slurry Feeder Agitators, Removal and Installation

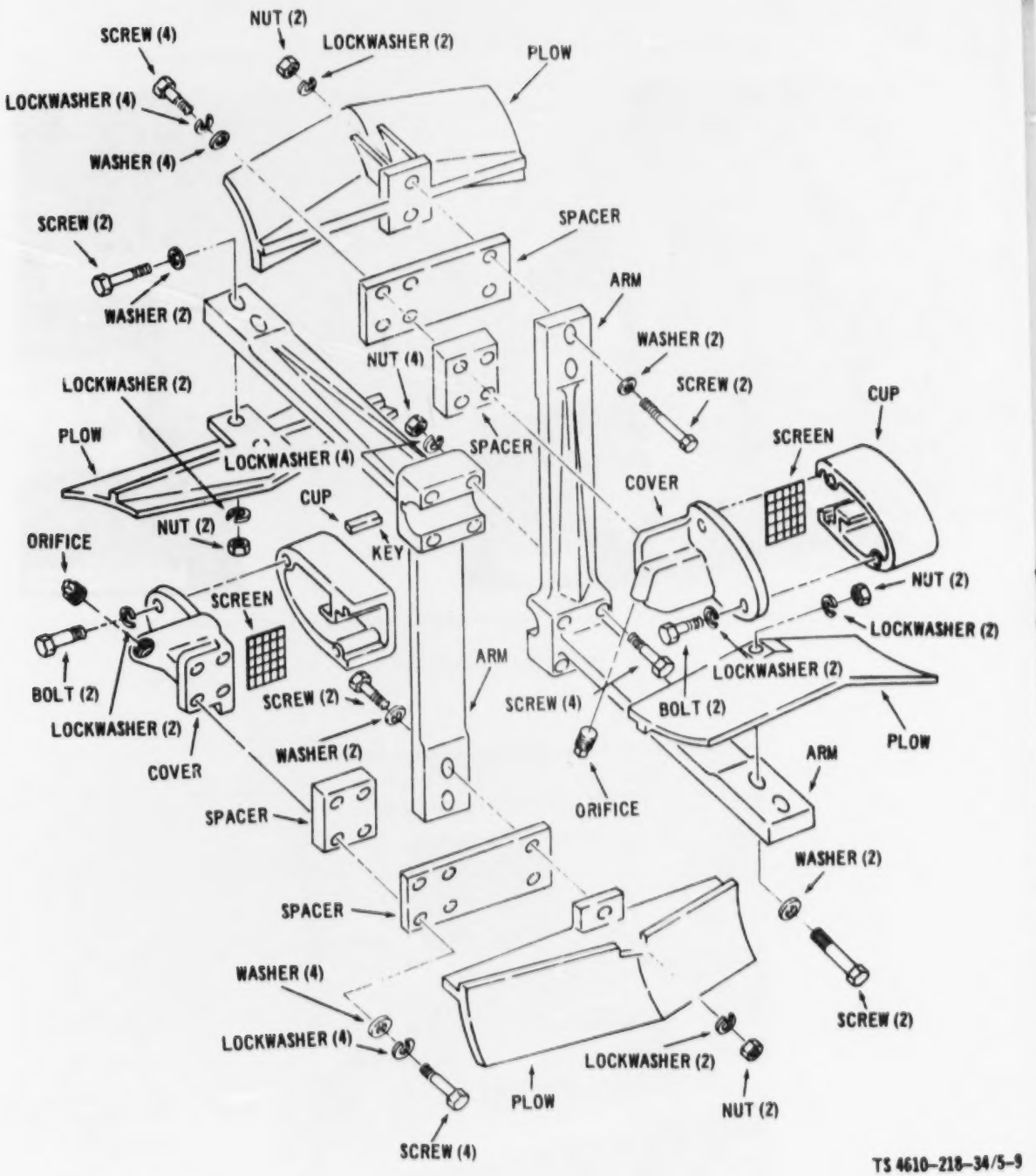


Figure 5-9. Slurry Feeder Agitators, Disassembly and Reassembly

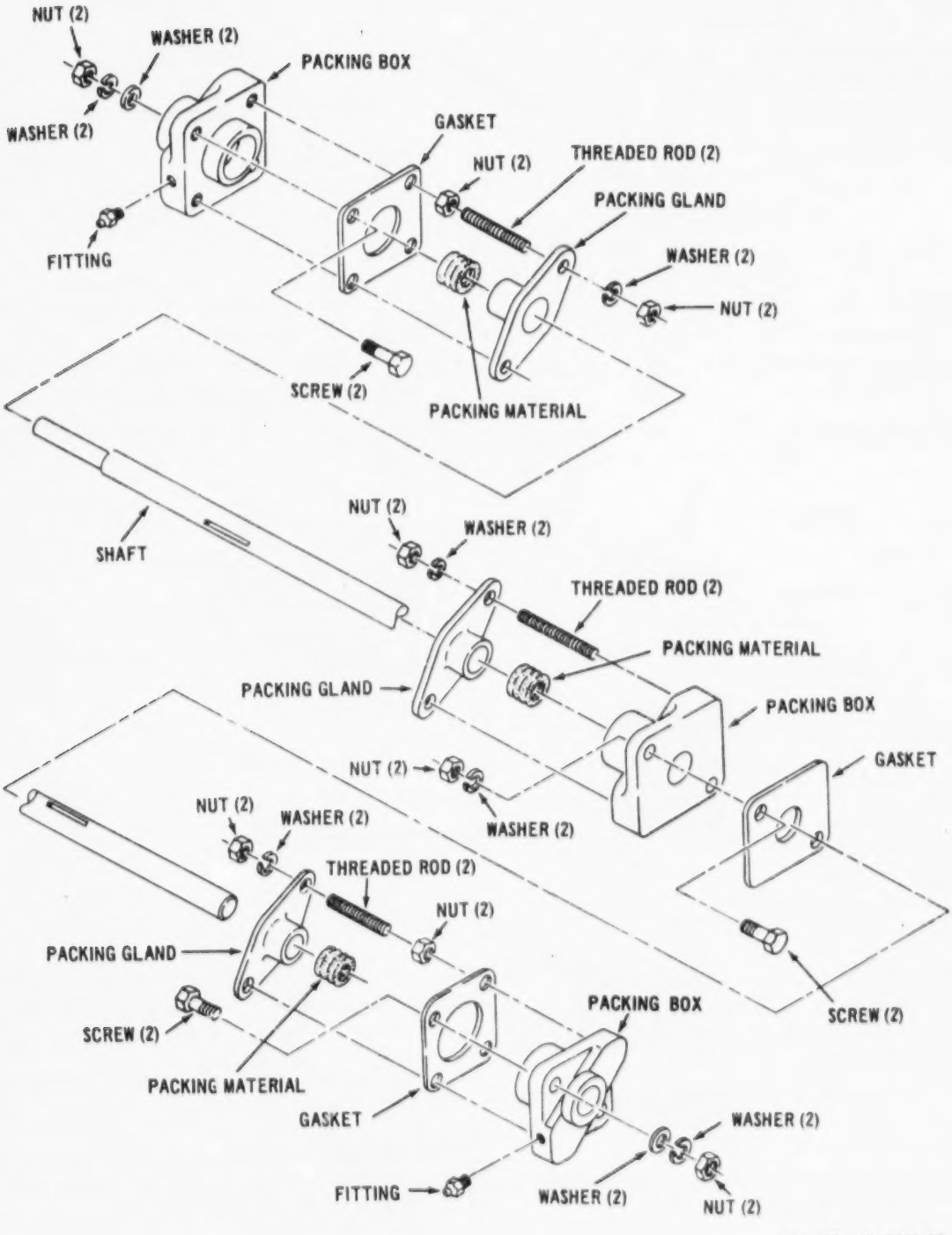


Figure 5-10. Slurry Feeder Shaft, Seals, and Bearings, Disassembly and Reassembly

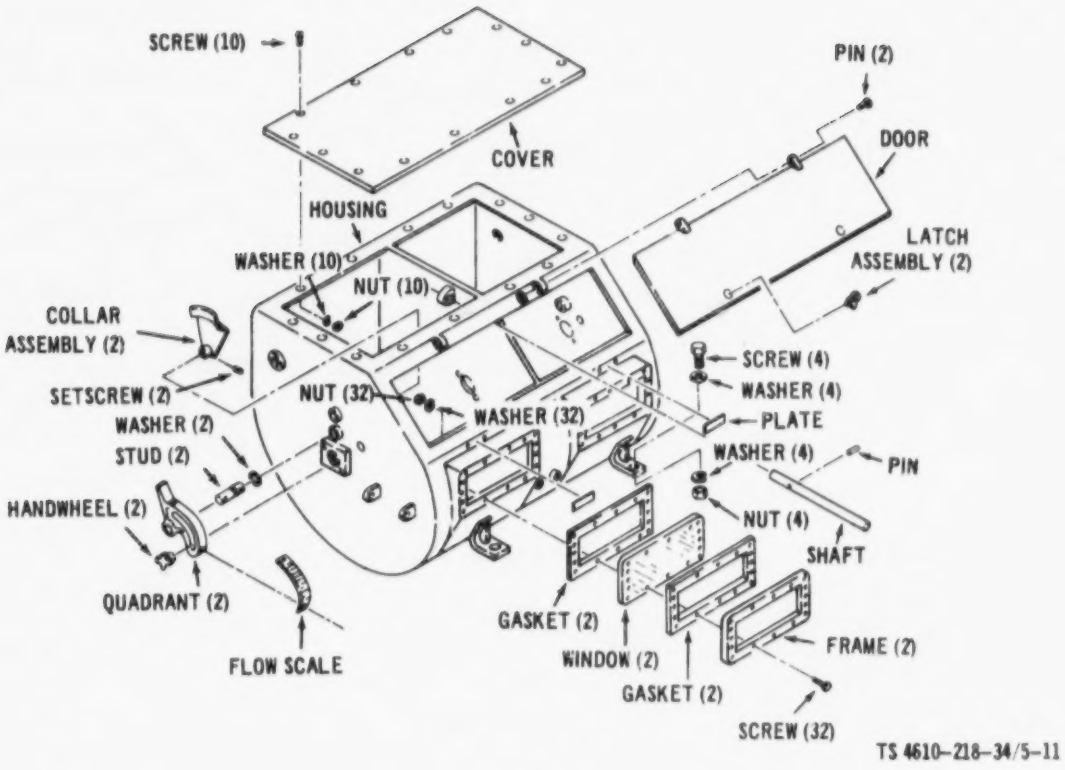


Figure 5-11. Slurry Feeder Housing, Disassembly and Reassembly

e. Reassembly.

(1) Reassembly of the slurry feeder housing is the reverse of the disassembly process described in figure 5-11.

(2) Reassembly of the slurry feeder shaft and seals is the reverse of the disassembly procedure described in figure 5-10.

(3) Reassemble the slurry feeder agitators as illustrated in figure 5-9.

f. Installation.

(1) Refer to figure 5-8 and install the slurry feeder agitators.

(2) Refer to figure 5-7 and install the chemical slurry feeder tank.

(3) Install the tubing between the dilution tank and the erdlator tank as illustrated in figure 5-6.

(4) Install the slip clutch as shown in figure 5-5.

(5) Refer to figure 5-4 and install the chain tightener and chain, install the chain guard as illustrated in figure 5-3.

(6) Install the filtered water piping as illustrated in figure 5-2.

(7) Install the raw water piping as shown in figure 5-1.

Section II. DIATOMITE DILUTION TANK ASSEMBLY

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

5-2. Diatomite Dilution Tank Assembly.

a. General. The diatomite dilution tank is made of aluminum and is welded watertight. It is mounted to brackets on the slurry feeder. The diatomite dilution tank provides storage for diatomite slurry to supply the suction line of the filter pump.

b. Removal. Remove the diatomite dilution tank as illustrated in figure 5-12.

c. Clean, Inspect and Replace.

(1) Clean the diatomite dilution tank with dry cleaning solvent P-D-680.

(2) Inspect the tank for cracks, breaks, and other damage.

(3) Replace a damaged or defective dilution tank.

d. Installation. Install the diatomite dilution tank as shown in figure 5-12.

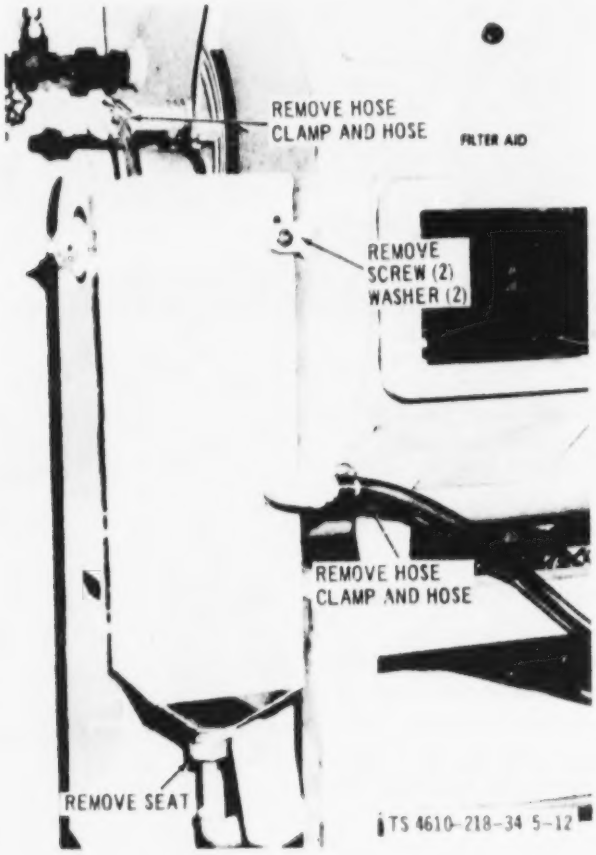


Figure 5-12. Chemical Slurry Feeder Diatomite Dilution Tank, Removal and Installation

Section III. CHEMICAL SLURRY FEEDER SPEED REDUCER

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

5-3. Chemical Slurry Feeder Speed Reducer.

a. General. The chemical slurry feeder speed reducer is located beneath the slurry feeder tank. It reduces the speed from the slurry feeder drive motor to the slurry feeder agitators.

b. Removal.

(1) Remove the chemical slurry feeder drive chain guard as illustrated in figure 5-13.

(2) Remove the drive chain as illustrated in figure 5-14.

(3) Remove the drive motor guard and drive belt as illustrated in figure 5-15.

(4) Remove the chemical slurry feeder speed reducer as illustrated in figure 5-15.

NOTE

If the speed reducer is to be replaced, retain the pully and the sprocket and key for installation on the replacement speed reducer.

c. Disassembly. Refer to figure 5-16 for disassembly of the speed reducer.

d. Clean, Inspect and Repair.

(1) Clean the speed reducer with dry cleaning solvent P-D-680.

(2) Inspect the input and output shaft seals for wear, deterioration, bent or distorted casings and other damage.

(3) Inspect the bearings for corroded or pitted surfaces and wear. Revolve the bearings by hand and check for rough spots.

(4) If the seals and bearings are in serviceable condition, cover them with a thin coat of light oil and wrap them in a lint-free cloth or waxed paper.

(5) Inspect the gear and worm for cracked or broken teeth and worn keyways.

(6) Inspect the shaft for damaged threads worn keyways, misalignment, and cracks.

(7) Inspect the housing, side covers, and bearing adapter for cracks and other damage.

(8) Replace all unserviceable parts.

e. Reassembly. Reassembly of the speed reducer is the reverse of the disassembly procedure as illustrated in figure 5-16.

f. Installation.

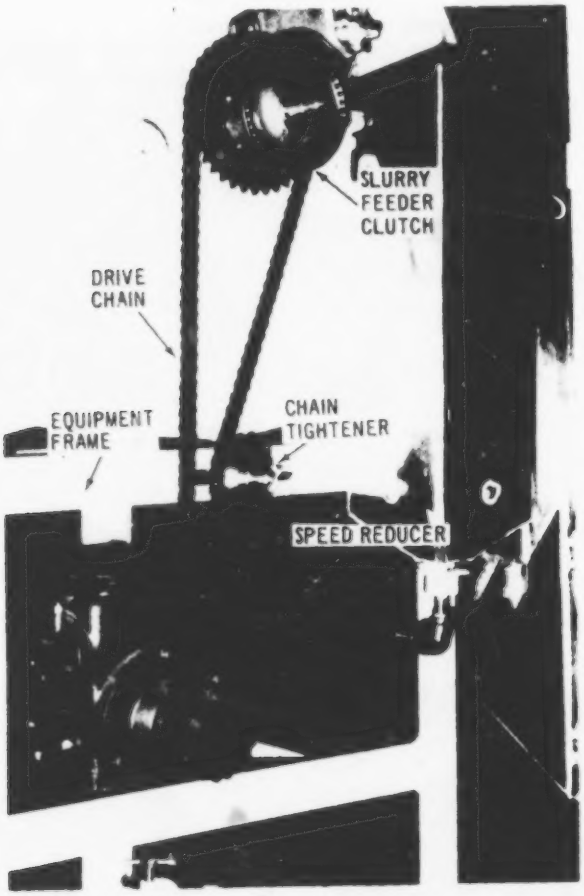
(1) Install the chemical slurry feeder speed as shown in figure 5-15.

(2) Install the drive belt and drive motor guard as shown in figure 5-15.

(3) Install the drive chain as shown in figure 5-14.

(4) Install the chemical slurry feeder drive chain guard as shown in figure 5-13.

Figure 5-13. Chain Guard, Removal and Installation



NOTE: TO ADJUST CHAIN UPON INSTALLATION, MOVE CHAIN TIGHTENER UNTIL CHAIN IS FREE OF SLACK THEN TIGHTEN NUT ON CHAIN TIGHTENER.

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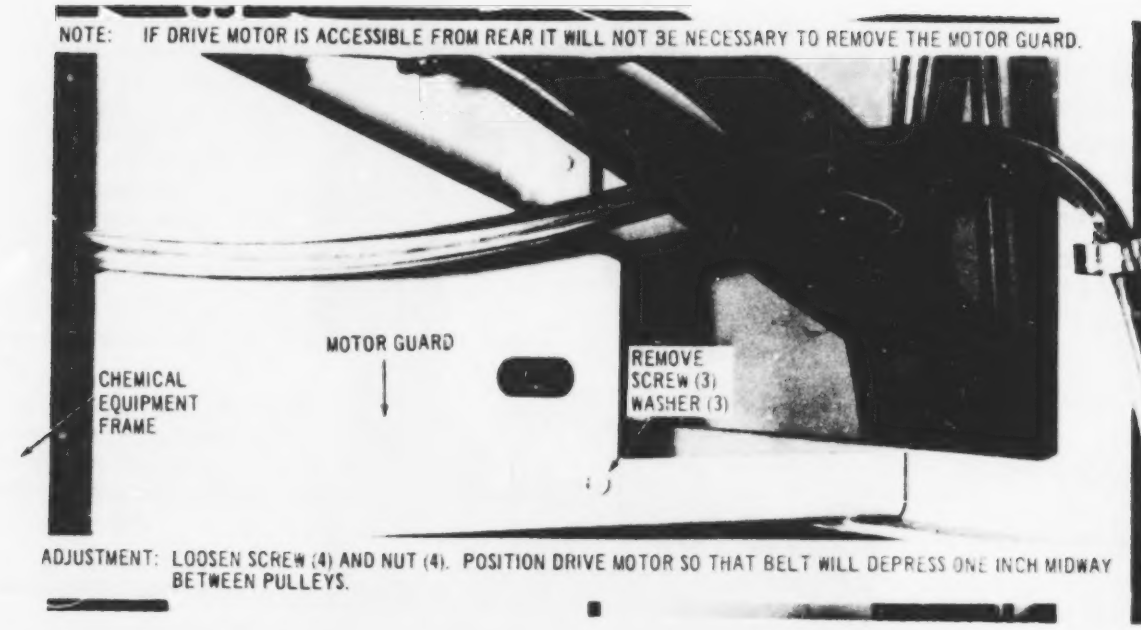
Figure 5-14. Chemical Slurry Feeder Chain and Chain Tightener, Removal and Installation.


NOTE: IF DRIVE MOTOR IS ACCESSIBLE FROM REAR IT WILL NOT BE NECESSARY TO REMOVE THE MOTOR GUARD.
MOTOR GUARD
CHEMICAL EQUIPMENT FRAME
REMOVE SCREW (3) WASHER (3)
ADJUSTMENT: LOOSEN SCREW (4) AND NUT (4). POSITION DRIVE MOTOR SO THAT BELT WILL DEPRESS ONE INCH MIDWAY BETWEEN PULLEYS.

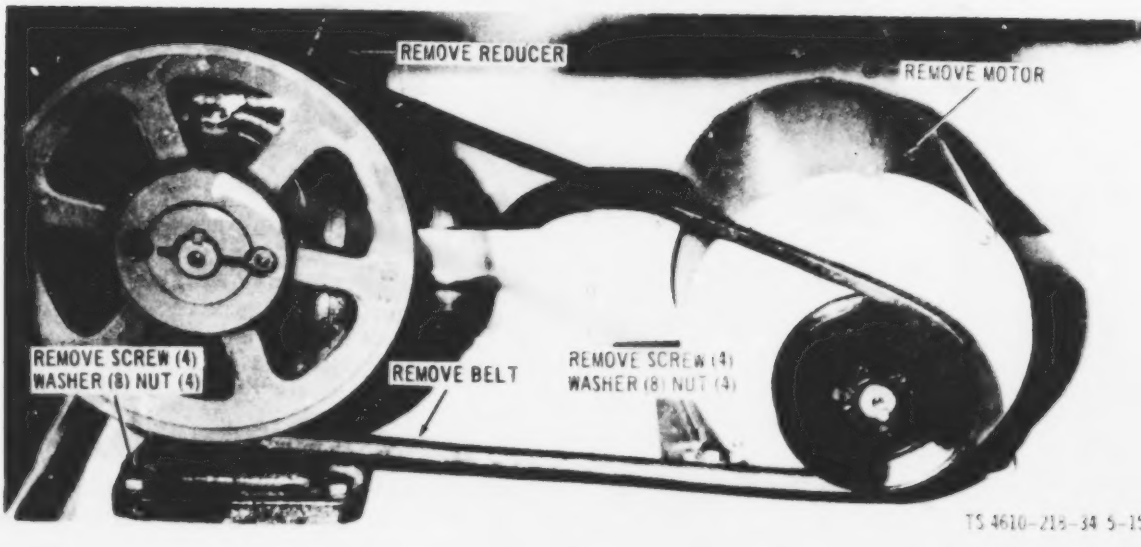


Figure 5-15. Slurry Feeder Drive Motor, Speed Reducer and Belt, Removal and Installation

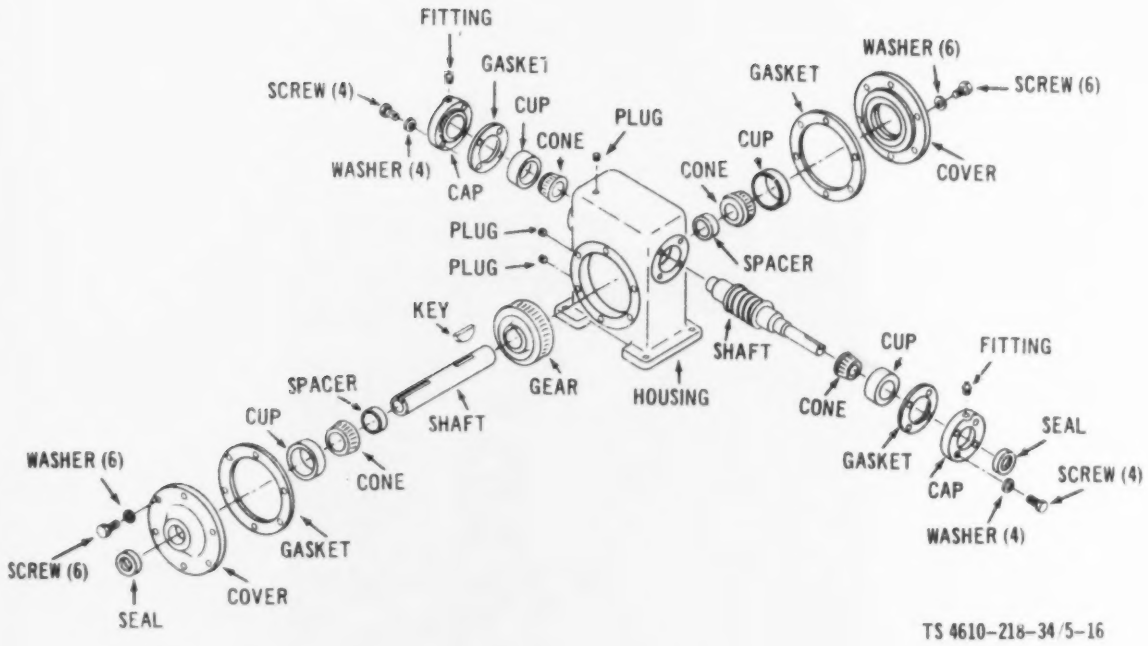


Figure 5-16. Slurry Feeder Speed Reducer, Disassembly and Reassembly

Section IV. CHEMICAL SOLUTION FEEDER

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

5-4. Chemical Soultion Feeder.

a. General. The chemical solution feeder consists of two diaphragm pumps operated by one electric motor through a gear reduction mechanism which transmits the power to reciprocating mechanisms and priming levers. The pumps operate at approximately 12 strokes per minute and each pump operates independently of the other. The gear mechanism and motor are encased in a cast housing and operate in oil.

b. Removal.

(1) Remove the chemical solution feeder as illustrated in figure 5-17.

(2) Remove the chemical solution feeder diaphragm pump bodies as illustrated in figure 5-17.

c. Disassembly.

(1) Refer to figure 5-18 for disassembly of the drive arms.

(2) Disassemble the solution feeder diaphragm pump as shown in figure 5-19.

(3) Refer to figure 5-20 for disassembly of the lever arms and push rods.

(4) Refer to figure 5-21 for disassembly of the junction box cover, receptacle, top housing, and lever arm shaft.

(5) Remove the gear unit as shown in figure 5-22.

(6) Refer to figure 5-23 and disassemble the gear unit.

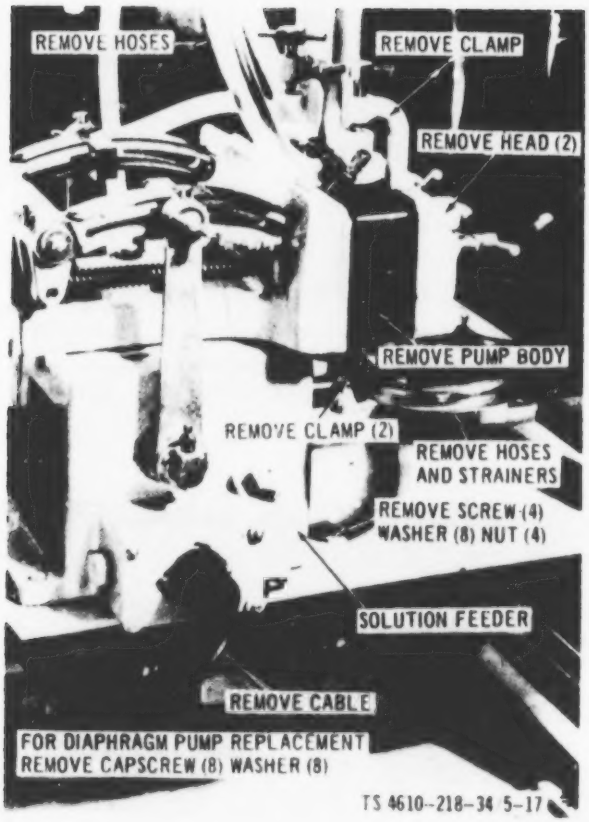


Figure 5-17. Chemical Solution Feeder, Removal and Installation

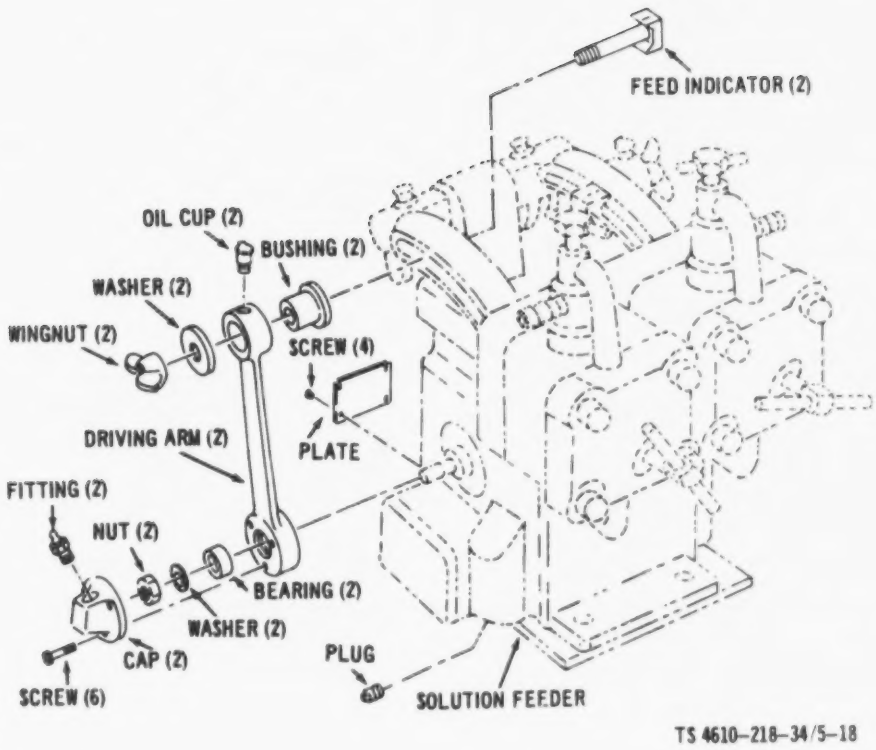


Figure 5-18. Chemical Solution Feeder Drive Arms, Disassembly and Reassembly

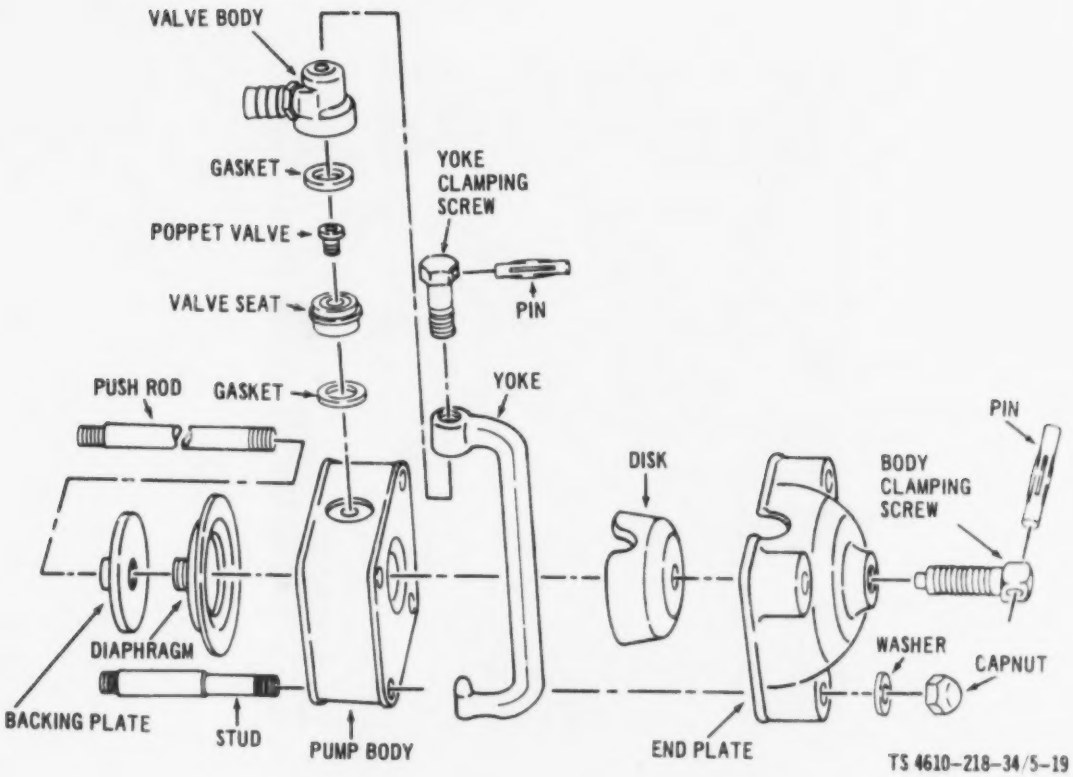


Figure 5-19. Chemical Solution Feeder Diaphragm Pump, Disassembly and Reassembly

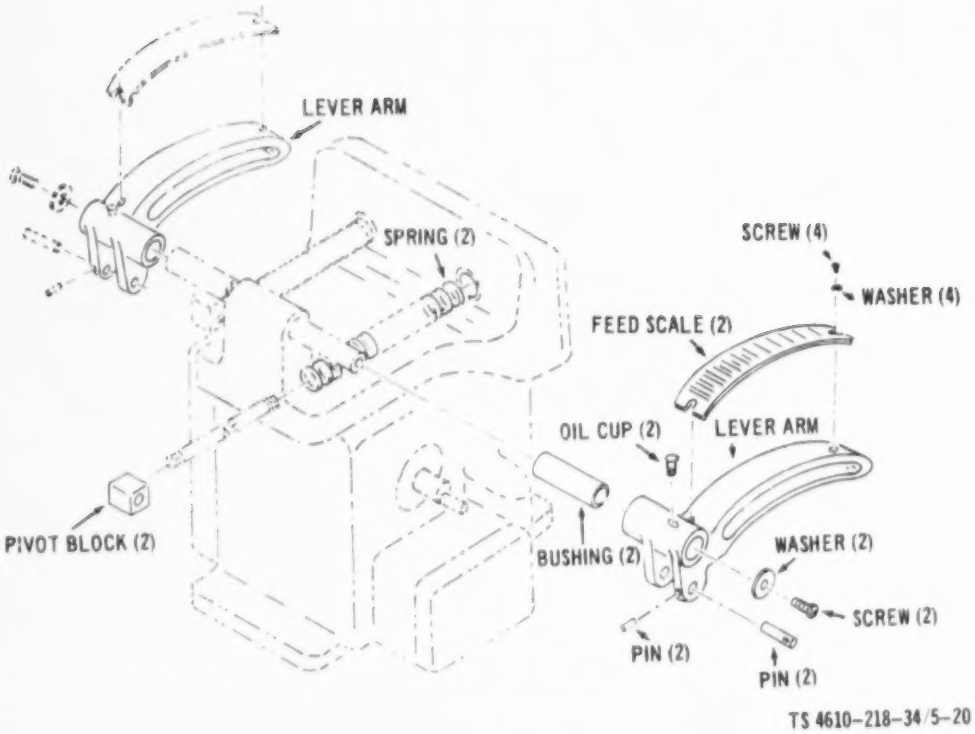


Figure 5-20. Chemical Solution Feeder Lever Arms and Push Rods, Disassembly and Reassembly

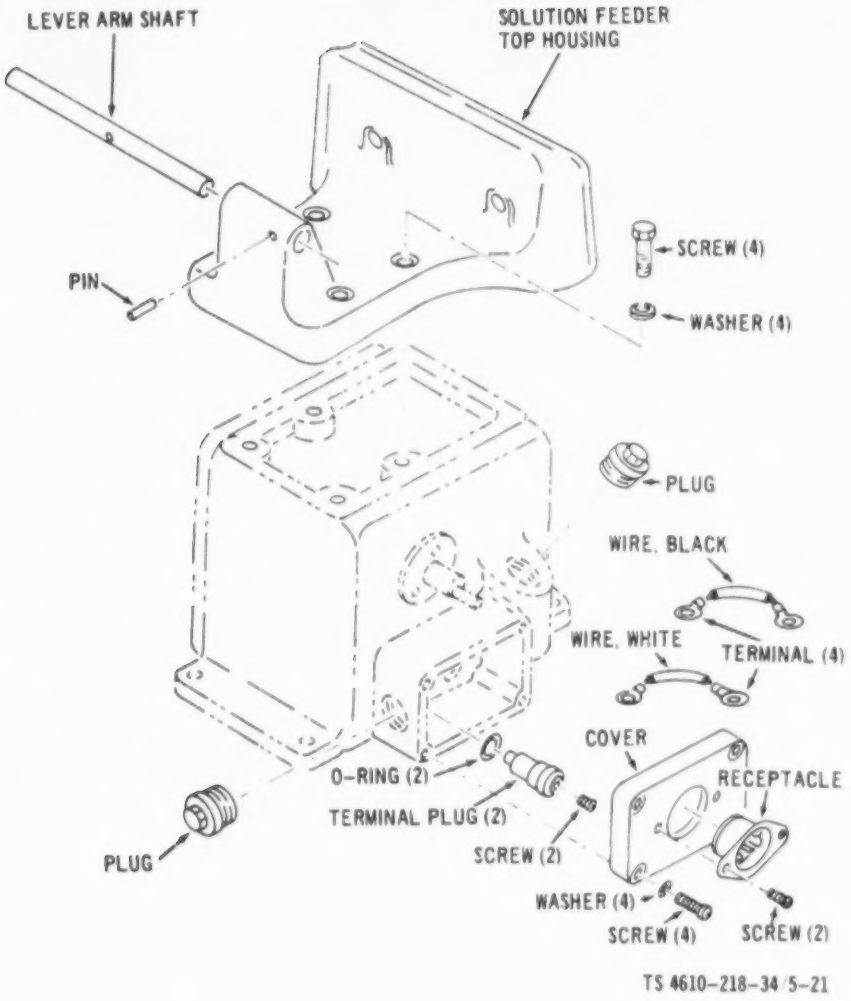


Figure 5-21. Chemical Solution Feeder Junction Box Cover Receptacle, Top Housing and Lever Arm Shaft, Disassembly and Reassembly

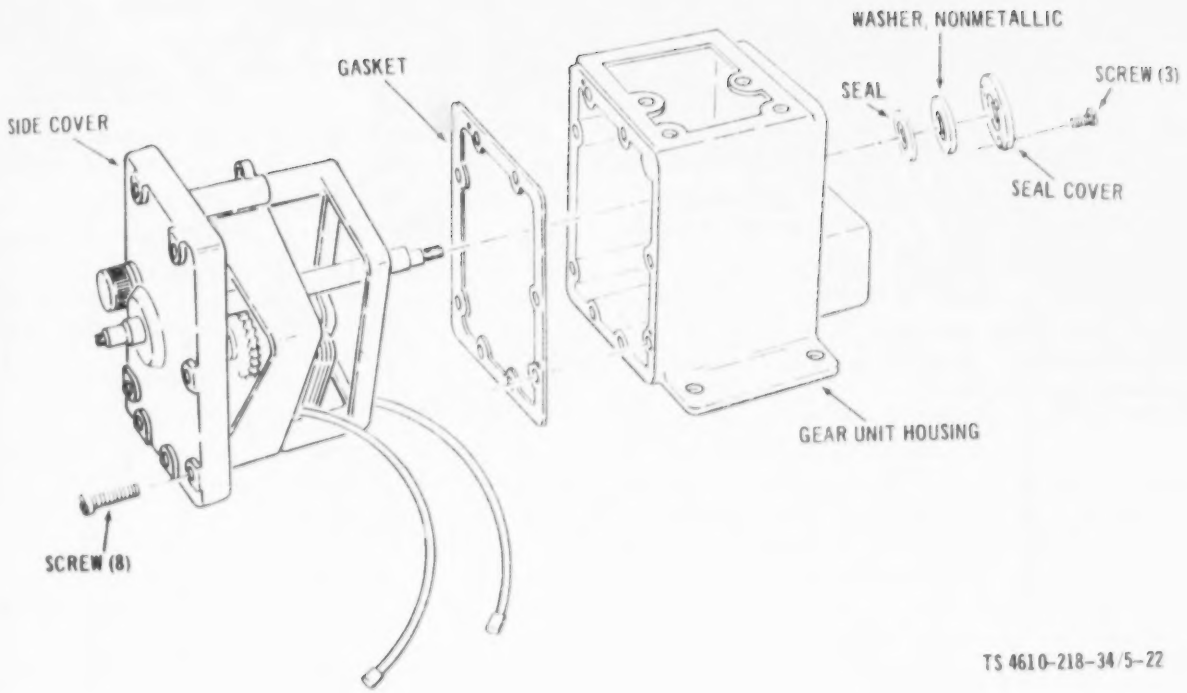


Figure 5-22. Chemical Solution Feeder Gear Unit, Removal and Installation

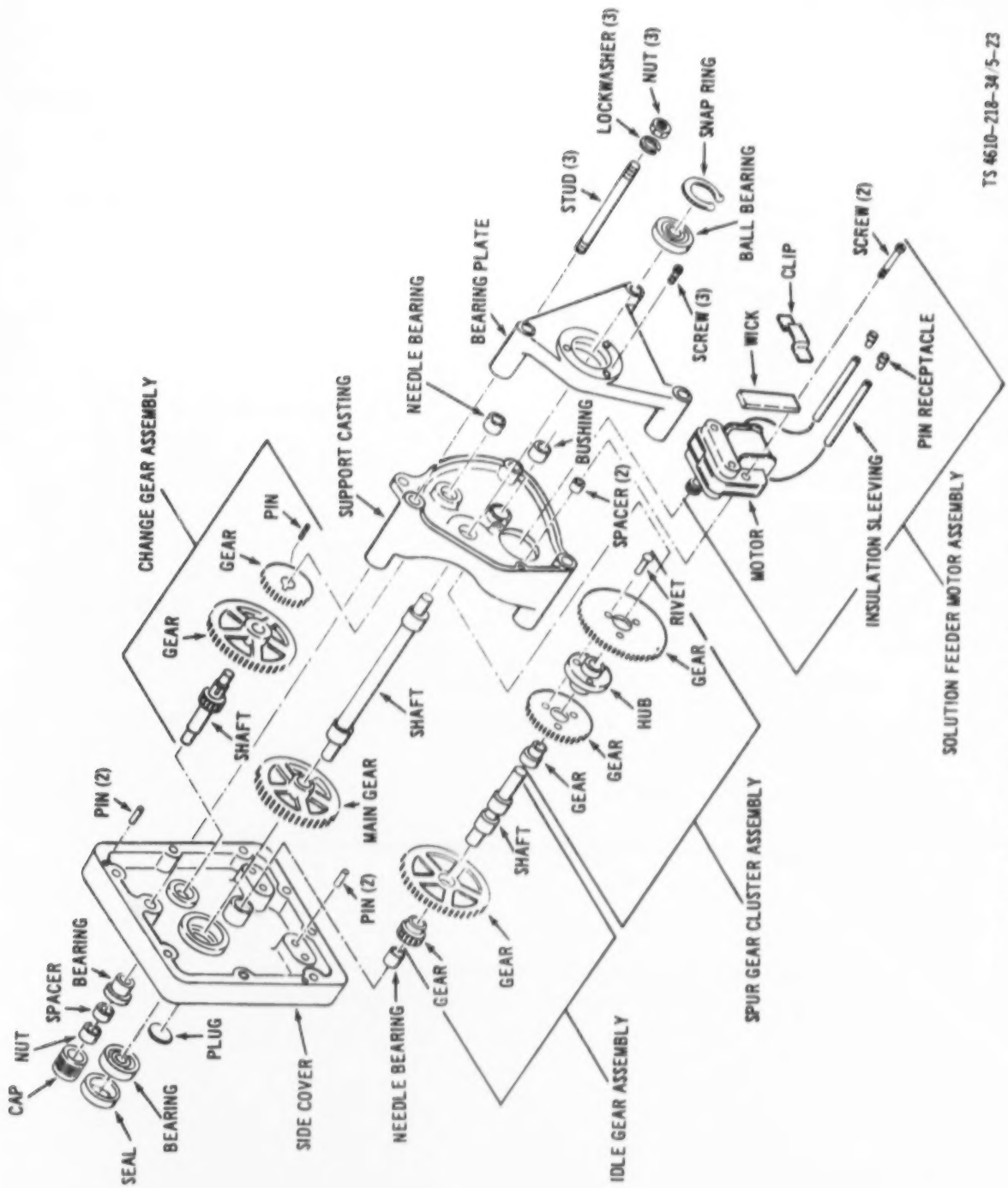


Figure 5-23. Chemical Solution Feeder Gear Unit, Disassembly and Reassembly

d. Clean, Inspect and Repair.

(1) Clean all parts with dry cleaning solvent P-D-680.

(2) Inspect top housing cover, gear unit housing, and the lever and drive arms for cracks.

(3) Inspect the gears and shafts for worn, chipped or broken teeth.

(4) Inspect push rods for misalignment, worn or damaged threads.

(5) Inspect the electrical components and spacers for deterioration and damage.

(6) Repair or replace all unserviceable parts not conforming to the Repair and Replacement Standards indicated in table 5-1.

e. Reassembly.

(1) Reassemble the gear unit as illustrated in figure 5-23.

(2) Install the gear unit as illustrated in figure 5-22.

(3) Refer to figure 5-21 and reassemble the junction box cover, receptacle, top housing and lever arm shaft.

(4) Reassemble the lever arms and push rods as illustrated in figure 5-20.

(5) Prior to test procedure or operation, each diaphragm on each pump shall be adjusted as follows:

(a) Set the length of stroke adjustment on the feeder scale at 6.0.

(b) Remove the knurled gear shift cap (located on the side of the feeder housing).

(c) Rotate the knurled shift nut until the pump push rod is pulled back as far as it will go.

(d) Screw the diaphragm on the push rod to such a point that the center of the diaphragm has .12 inch (3.05 mm) clearance between a straight edge placed across the flat portion of the diaphragm.

(e) Re-install the knurled gear shift cap.

(6) Reassemble the solution feeder diaphragm pump as shown in figure 5-19.

(7) Reassemble the drive arms as illustrated in figure 5-18.

f. Installation.

(1) Install the chemical solution feeder diaphragm pump bodies as shown in figure 5-17.

(2) Install the chemical solution feeder as shown in figure 5-17.

(3) Lubricate the chemical solution feeder as indicated in LO 5-4610-218-12.

(4) The rate of discharge from each pump shall be within plus or minus 5 percent of indicated rate at any scale setting and operate against a back pressure from 0 to 5 PSIG and a suction lift from 0 to 6 feet.

(5) Installation must be such that siphoning cannot occur, be sure all hose connections are tightly secured. Filtered water shall be used as the testing solution.

(6) With a suction lift of not less than 1 foot (30.48 cm) and 4 feet (1.219 m) discharge pressure, measure volumetrically the discharge for one minute at a scale setting of 1.2 from each head. Volume from each pumping head shall be 33.2 (plus or minus 1.6) ml/min.

(7)Measure volumetrically the discharge for one minute at a scale setting of 6.0 from each head. Volume from each pumping head shall be 166 (plus or minus 8.3) ml/min.

(8) The interval of time after any change of the scale setting and before measuring shall be not less than two minutes.

(9) Failure of the chemical solution feeder to function as specified will require re-adjustment of the pumping head diaphragms and re-testing.

Table 5-1. Repair and Replacement Standards

Component	Manufacturer's dimensions tolerances in inches (and millimeter)		Desired clearance		Maximum allowable wear and clearance
	Min	Max	Min	Max	
Chemical Solution Feeder Assembly:					
Main gear shaft & L.H. main bearing	———	———	.0003 (.008)	.0006 (.015)	———
Main gear shaft & R.H. main bearing	———	———	.0001 (.003)	.0002 (.005)	———
Shaft bearing surface diameter (L.H.)	.6687 (16.985)	.6690 (16.993)	———	———	.0000 (.000)
Bearing, inside diameter (L.H.)	.6693 (17.000)	.6693 (17.000)	———	———	.0000 (.000)
Shaft bearing surface diameter (R.H.)	.6298 (15.997)	.6301 (16.005)	———	———	.0000 (.000)
Bearing, inside diameter (R.H.)	.6299 (15.999)	.6299 (15.999)	———	———	.0000 (.000)
Main gear shaft & driving arm bearings	———	———	.0005 (.013)	.0010 (.025)	———
Shaft bearing surface diameter	.3140 (7.976)	.3145 (7.988)	———	———	.0000 (.000)
Driving arm bearing, inside diameter	.3150 (8.001)	.3150 (8.001)	———	———	.0000 (.000)
Lever arm bearings and shaft	———	———	.0000 (.000)	.0014 (.036)	
Shaft bearing surface diameter	.7506 (16.065)	.7510 (19.075)	———	———	.0010 (.000)
Bearing, inside diameter	.7510 (19.075)	.7520 (19.101)	———	———	.0050 (.127)
Hinge block and pin	———	———	.0015 (.038)	.0040 (.102)	———

Table 5-1. Repair and Replacement Standards (continued)

Component	Manufacturer's dimensions tolerances in inches (and millimeter)		Desired clearance		Maximum allowable wear and clearance
	Min	Max	Min	Max	
Pin diameter	.3100 (7.874)	.3115 (7.912)	———	———	.0010 (.025)
Hinge block bearing, inside diameter	.3130 (7.950)	.3140 (7.976)	———	———	.0050 (.127)
Driving arm bearing and scale pointer	———	———	.0030 (.076)	.0090 (.229)	———
Scale pointer diameter	.3700 (9.398)	.3750 (9.525)	———	———	.0010 (.025)
Driving arm bearing	.3780 (9.601)	.3790 (9.627)	———	———	.0050 (.127)
Slurry Feeder Assembly:					
Shaft and main bearing	———	———	.0027 (.069)	.0097 (.246)	———
Shaft bearing surface diameter	1.2140	1.2160	———	———	.0050 (.127)
Main bearings, inside diameter	1.2187 (30.955)	1.2237 (31.082)	———	———	.0050 (.127)
Erdlator Agitator:					
Agitator bottom stub shaft and bearing	———	———	.0020 (.051)	.0000 (.000)	———
Stub shaft diameter	1.1230 (28.524)	1.1250 (28.575)	———	———	.0050 (.127)
Bearing inside diameter	1.1250 (28.575)	———	———	———	.0100 (.254)

CHAPTER 6
REPAIR OF DIATOMITE FILTER ASSEMBLY COMPONENTS

Section I. DIATOMITE FILTER AIR RELEASE VALVE

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flashpoint of P-D-680 is 100-138°F (38-59°C).

6-1. Diatomite Filter Air Release Valve.

a. General. A diatomite filter air release valve is located on top of the filter housing. It releases air trapped in the filter housing cover on the effluent side of the filter elements. A weak or broken spring, cracked of defective diaphragm, or corroded disk and rod will cause improper operation of the filter and valve.

b. Removal. Remove the diatomite filter air release valve as illustrated in figure 6-1.

c. Disassembly. Refer to figures 6-2 and 6-3 and disassemble the air release valve.

d. Clean, Inspect and Repair.

(1) Clean all metal parts with dry cleaning solvent P-D-680.

(2) Clean the diaphragm, gasket, and retainer in alcohol or a nonmineral base cleaning solvent.

(3) Inspect the spring for loss of tension.

(4) Inspect the diaphragm and rod for signs of wear.

(5) Inspect the rubber seat on the disk to see if it is tight on the disk and not cracked or worn.

(6) Replace all damaged or defective parts.

e. Reassembly. Refer to figures 6-3 and 6-2 and reassemble the air release valve.

f. Installation. Install the diatomite filter air release valve as shown in figure 6-1.

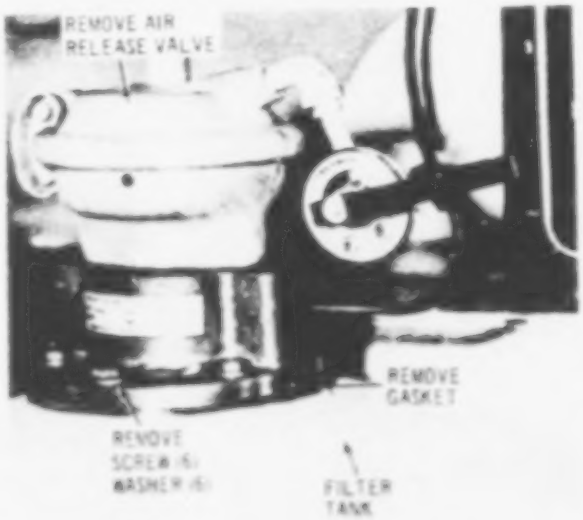


Figure 6-1. Diatomite Filter Air Release Valve, Removal and Installation

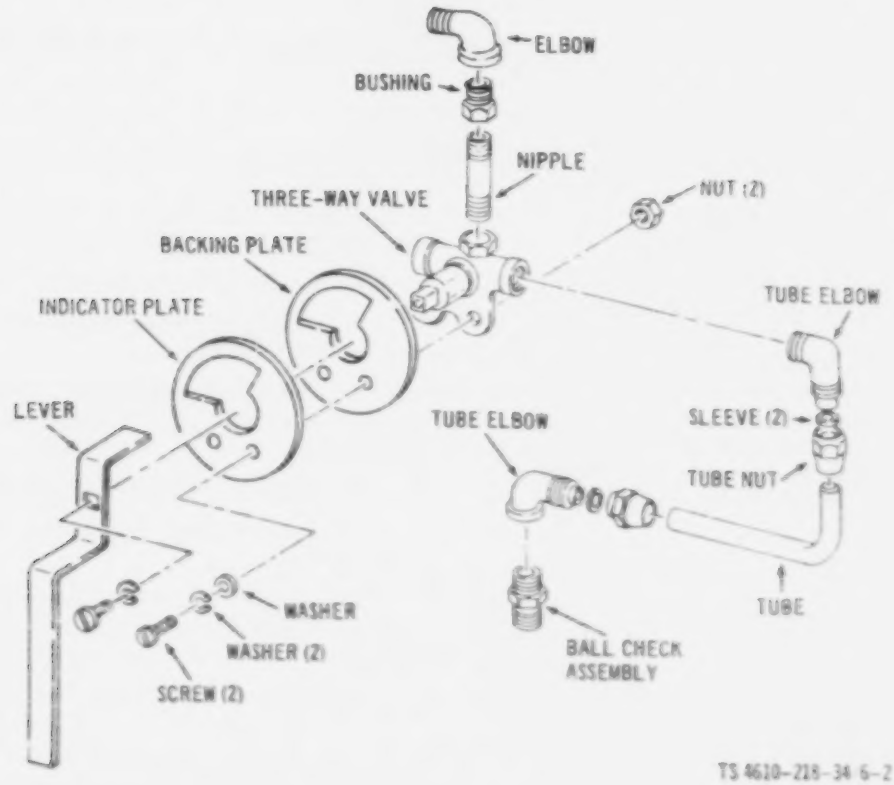


Figure 6-2. Diatomite Filter Air Release Valve, Three-Way Valve, Disassembly and Reassembly

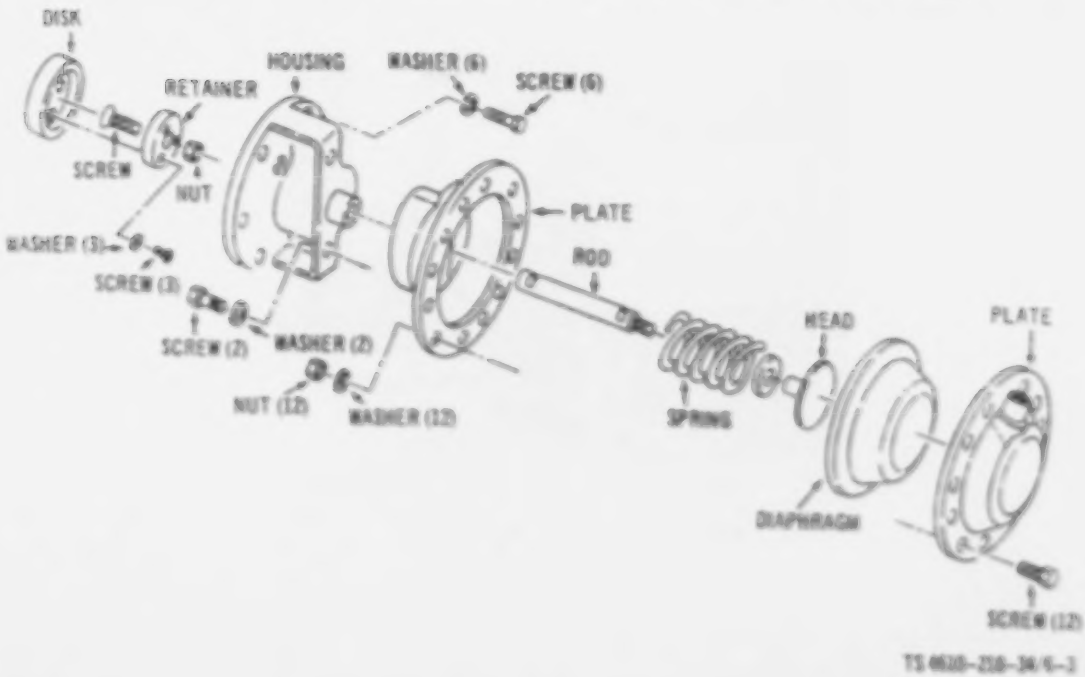


Figure 6-3. Diatomite Filter Air Release Valve, Disassembly and Reassembly

Section II. ADJUSTABLE FLOW CONTROLLER

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flash-point of P-D-680 is 100-138°F (38-59°C).

6-2. Adjustable Flow Controller.

a. General. The flow controller valve is located in the effluent, or filtered water line. The water line is painted green. The function of the flow controller valve is to regulate the flow of water through the filter. There is a knob on the flow controller with a dialmarked 0 to 30 gpm. The flow can be regulated by setting the pointer on the knob to point to the desired flow.

b. Removal. Remove the adjustable flow controller valve as illustrated in figure 6-4.

c. Disassembly. Refer to figure 6-5 for the disassembly of the valve.

d. Clean, Inspect and Repair.

(1) Clean all metal parts in dry cleaning solvent P-D-680 and dry throughly.

(2) Clean the diaphragm in alcohol or a nonmineral base cleaning solvent.

(3) Inspect the diaphragm for cracks and sigrs of wear.

(4) Inspect the threaded parts for damaged threads.

(5) Inspect the shaft and stem for misalignnent.

(6) Repair or replace all damaged or defective parts.

e. Reassembly. Reassemble the flow controller valve as illustrated in figure 6-5.

f. Installation and Calibration. Install and calibrate the flow controller valve as illustrated in figure 6-4.

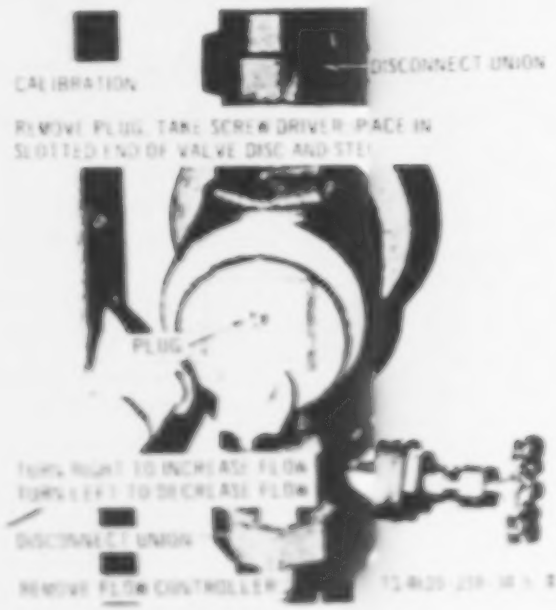


Figure 6-4. Adjustable Flow Controller, Removal, Installation, and Calibration

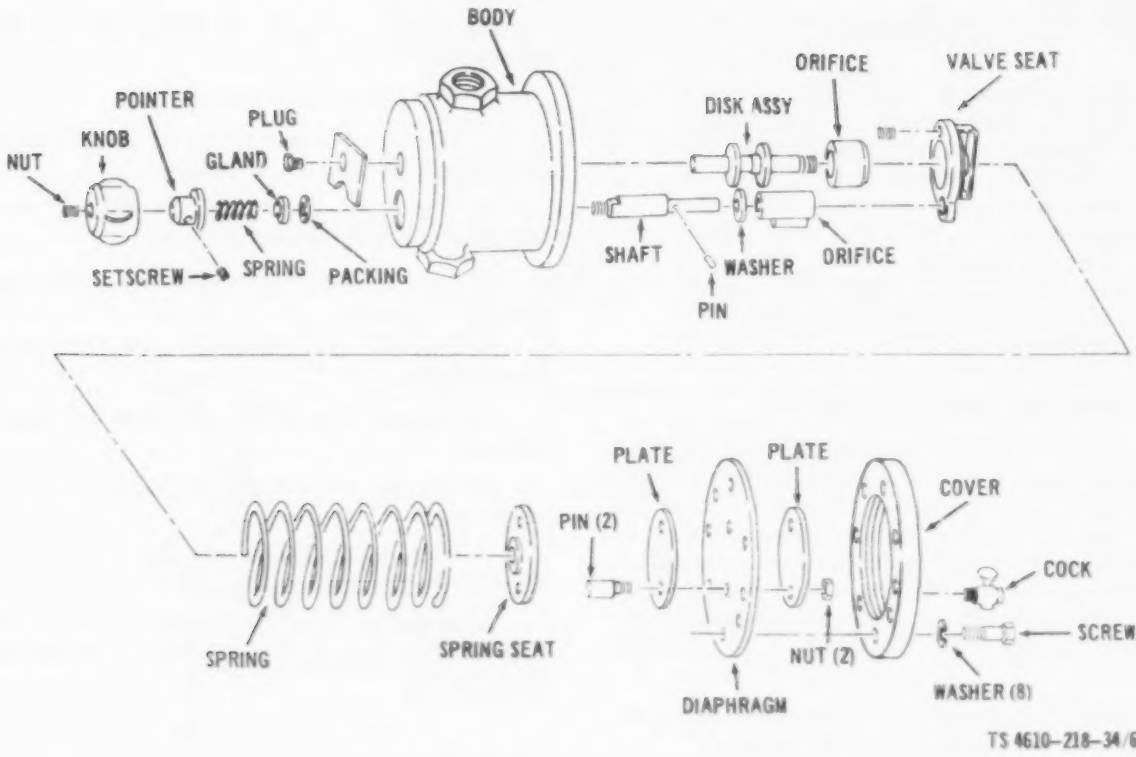


Figure 6-5. Adjustable Flow Controller, Disassembly and Reassembly

Section III. DIATOMITE FILTER PUMP MOTOR

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous. Avoid repeated and prolonged breathing of the vapors and skin contact with the liquid. Do not use near open flame or excessive heat. Use in a well-ventilated area. The flashpoint of P-D-680 is 100-138°F (38-59°C).

6-3. Diatomite Filter Pump Motor.

a. General. The diatomite filter pump and motor are enclosed in separate housings which are bolted together to form a single intergal unit. The motor can be disassembled separately after removing the unit.

b. Removal.

(1) Refer to figure 6-6 for removal of diatomite filter pump and motor from the floor.

(2) Remove the motor from the filter pu as illustrated in figure 6-6.

c. Disassembly. Disassemble the filter pu as illustrated in figure 6-7.

d. Clean and Inspect.

(1) Clean all metal except the beari with dry cleaning solvent P-D-680.

(2) Clean the outside of the bearings w a lint-free cloth dampened with a light eng oil. Do not dry the bearings with compres air.

(3) Inspect the filter pump motor base repair any cracks by welding.

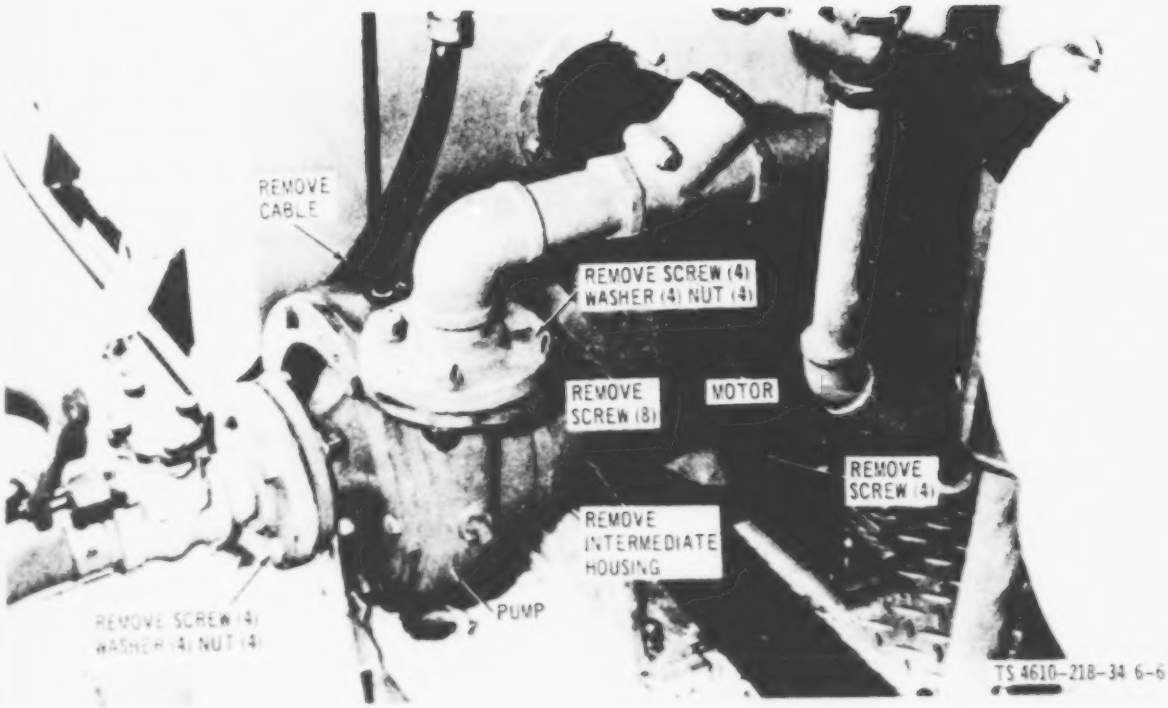


Figure 6-6. Diatomite Filter Pump and Motor, Removal and Installation

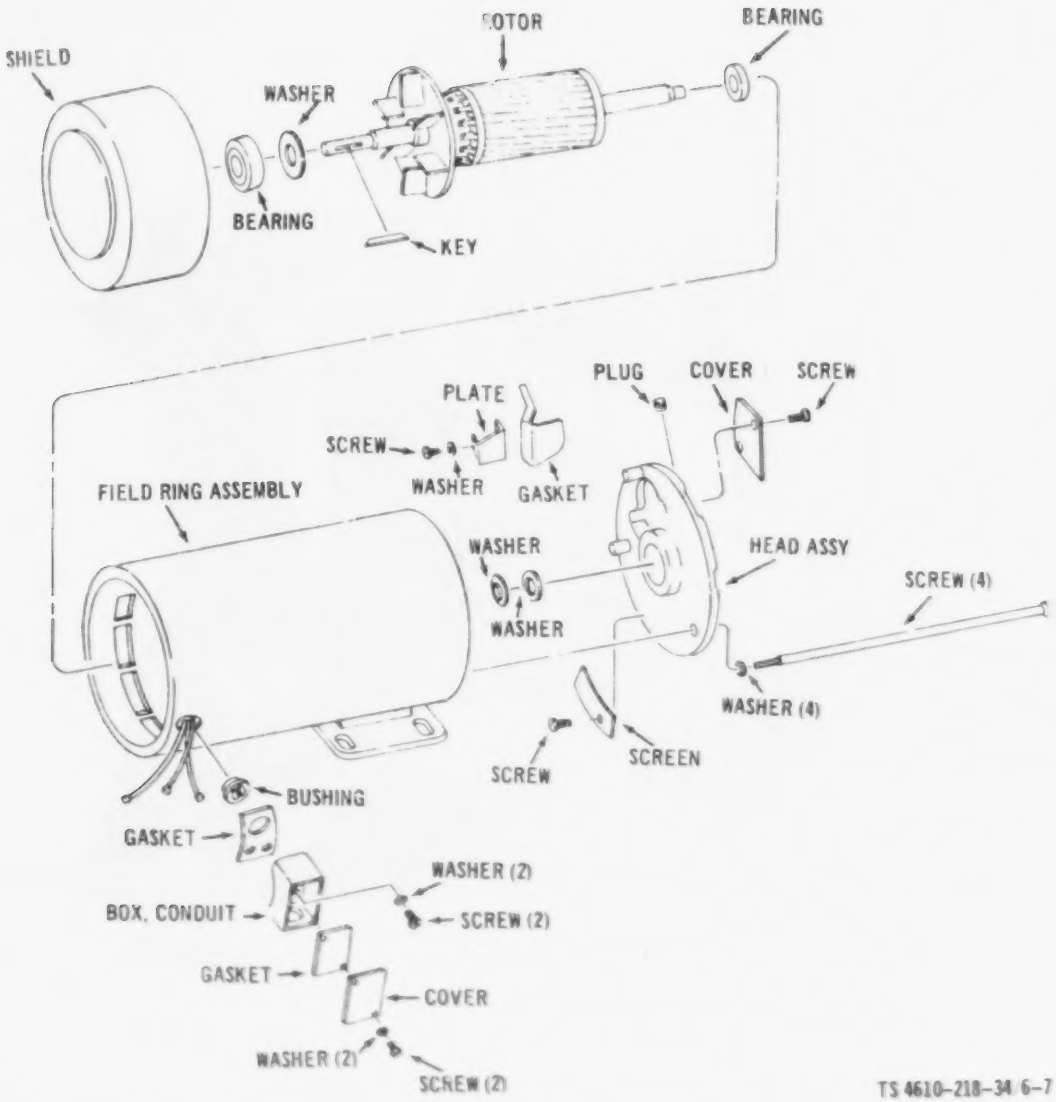


Figure 6-7. Diatomite Filter Pump Motor, Disassembly and Reassembly

(4) Inspect the mounting hardware and threaded holes for damaged threads.

(5) Inspect the wiring for damaged insulation.

(6) Inspect the shaft and fan of the rotor for cracks and other damage.

(7) Inspect the rotor cage and bars for cracks and breaks. Inspect the bars for signs of overheating.

(8) Rotate the bearings by hand nd spect them for lack of lubrication and dfect balls and races. If the bearings are servicab oil them with a light engine oil and wr them in waxed paper or in a lint-free cth protect them from dust until they are insalk

(9) Inspect both head assembls cracks and distortion.

e. Testing the Field Coils.

(1) Test the field coils for open circuits by placing the test prods of a growler in series with each winding in turn. If the lamp does not light, there is an open circuit, and the fields must be replaced.

(2) Test the field coils for ground by holding one prod of a test lamp to the field body and touching each terminal wire in turn with the other prod. If the test lamp lights, it indicates a grounded coil.

f. Testing the Stator.

(1) Use an inside growler to test the stator for a short-circuited winding.

(2) Position the growler in the stator core with the jaws bridging a slot.

(3) Hold a thin steel strip (such as a hacjsaw Blade) parallel to the core slots. Energize the growler and explore the core surface approximately one pole distance on either side of the slot under test. Continue testing one core at a time until all the coils are tested.

(4) If the coil is shorted, the metal strip will vibrate when brought close to the affected slot. Replace a shorted stator, or repair as applicable.

g. Repair.

(1) Replace components with damaged threads if the threads cannot be restored.

(2) Replace the rotor if it is defective.

(3) Repair damaged or cracked insulation on the winding and the wires of the fields.

(4) Replace the field coils if they are shorted or open.

(5) Replace the bearings if they are dry, rough, or worn.

(6) Replace the heads if they are cracked or distorted.

(7) Repair or replace all other damaged or defective parts.

h. Reassembly. Refer to figure 6-7 for reassembly of the filter pump motor.

i. Installation.

(1) Install the motor on the filter pump as shown in figure 6-6.

(2) Install the diatomite filter pump and motor as shown in figure 6-6.

APPENDIX A
REFERENCES

A-1. Fire Protection and Safety.

TB 5-4200-200-10	Hand Portable Fire Extinguishers for Army Users

A-2. Lubrication.

C 9100-IL	Fuel, Lubrication, Oils and Waxes, Water Purification Unit, Van Type, Body Mounted, Model EMC 1500S

A-3. Painting.

TM 43-0139	Painting Instructions for Field Use

A-4. Maintenance.

TM 5-4610-218-20P	Organizational Maintenance RepairParts and Special Tools List, Water Purification Unit, Van Type, Body Mounted, Model EMC 1500S
TM 9-2320-209-10	Operator's Manual for 2 1/2-ton 6x6 Chassis, Truck
TM 9-2300-213-14	Operator, Organizational, DS and GS Maintenance Manual (Including Repair Parts and Special Tools List), Trailer, Cargo, 1 1/2-ton, 2-wheel
TM 5-4520-233-14	Operator, Organizational, Direct and General Support Maintenance Manual. Heater, Space, Multi-fuel, with Blower, 60,000 BTU/HR (Hunter Model UH-68D)

A-5. Storage.

TM 740-90-1	Administrative Storage of Equipment

APPENDIX B
EXPENDABLE SUPPLIES AND MATERIALS LISTS

Section I. INTRODUCTION

B-1. Scope. This appendix lists expendable supplies and materials you will need to operate and maintain the Water Purification Unit 1500 GPH. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

B-2. Explanation of Columns.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the "Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbrevation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	0	6810-00-242-4770	CALCIUM HYPOCHLORITE TECHNICAL: 3 3/4 lb. plastic bottle; Type 1,	CO
2	0	6810-00-264-6575	CHARCOAL, ACTIVATED, POWDERED: 50 lb. drum.	DR
3	0	6810-00-664-0283	FERRIC CHLORIDE, ANGYDROUS, CRYSTALLINE TECHNICAL: 100 one lb. bags per drum.	DR
4	0	9390-00-443-4703	DIATOMACEOUS EARTH: calcined; powder; 3 cu. ft. sack	EA
5	0	6810-00-087-2340	INDICATOR SOLUTION, pH WIDE RANGE: 16 oz. plastic bottle.	BT
6	0	6810-00-585-2017	LIMESTONE, PULVERIZED: calcium carbonate, 93 pct. min., powder, USS sieve no. 100, 10 pct. max. retained, no. 325, 35 pct. max. passing, 100 lb. paper bag.	BG
7	0	6810-00-270-8289	O-TOLIDINE DIHYDRO-CHLORIDE SOLUTION: 16 oz. plastic bottle.	BT
8	0	6810-00-986-3471	SODIUM ARSENITE SOLUTION: 16 oz. plastic bottle.	BT

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

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COA, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 5-4610-218-34	1 Aug 79	Water Purification Unit

BE EXACT. .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN.

SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
JOHN DOE, PFC (268) 317-7111	John Doe

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

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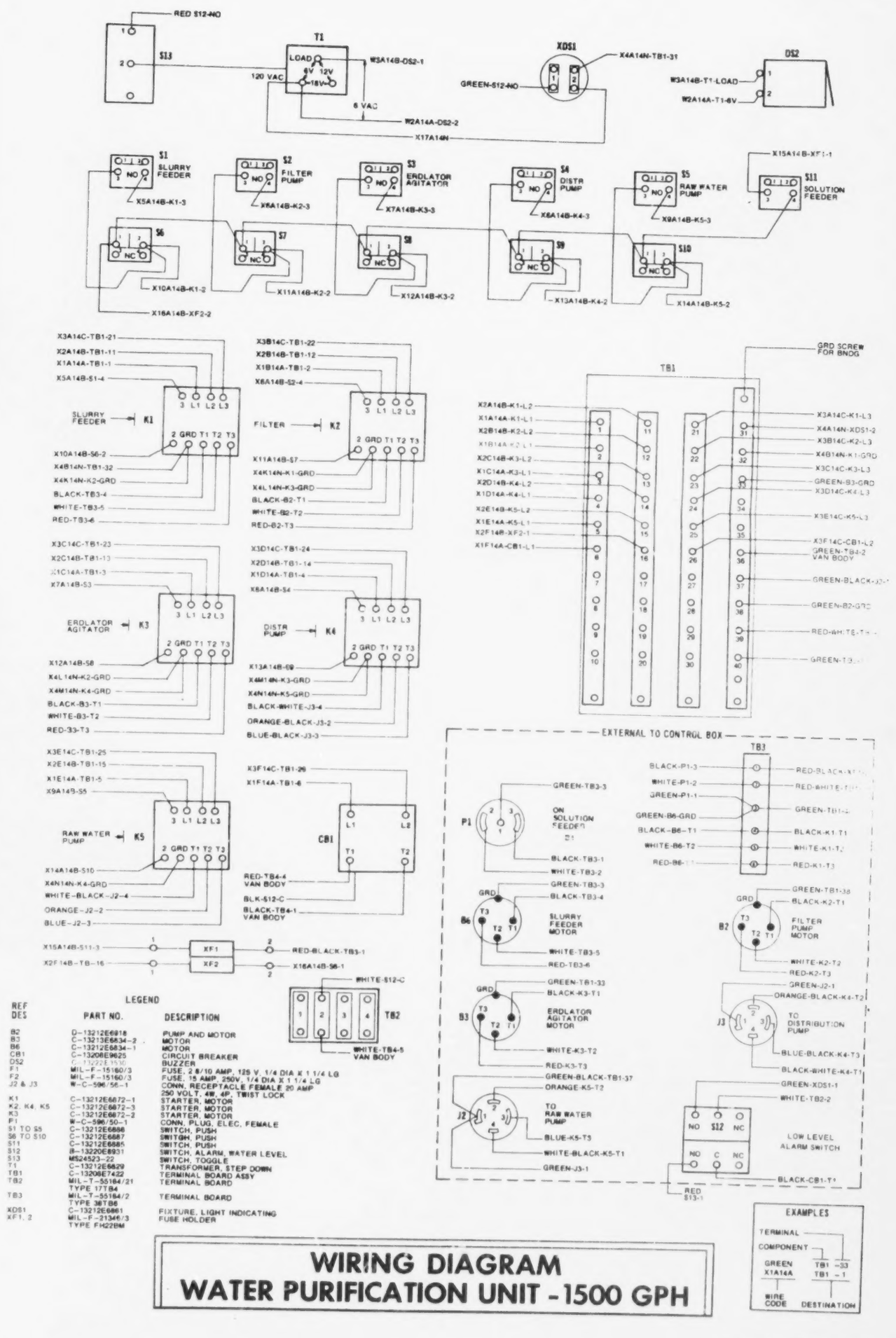
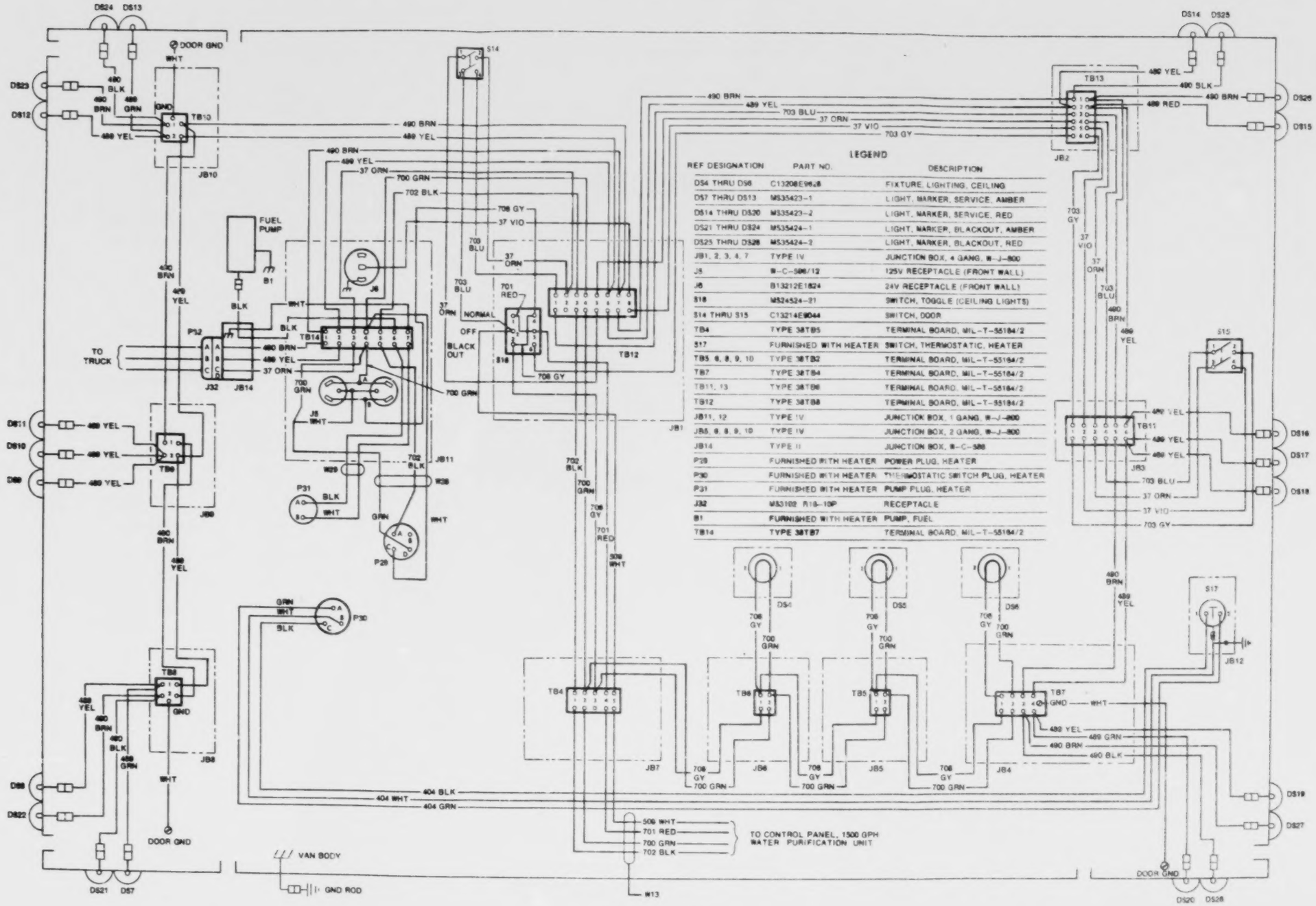


LEGEND

REF DES	PART NO.	DESCRIPTION
B2	D-13212E6918	PUMP AND MOTOR
B3	C-13213E6834-2	MOTOR
B6	C-13212E6834-1	MOTOR
CB1	C-13208E9625	CIRCUIT BREAKER
DS2	C-13212E6900	BUZZER
F1	MIL-F-15160/3	FUSE, 2 8/10 AMP, 125 V, 1/4 DIA X 1 1/4 LG
F2	MIL-F-15160/3	FUSE, 15 AMP, 250V, 1/4 DIA X 1 1/4 LG
J2 & J3	W-C-596/56-1	CONN, RECEPTACLE FEMALE 20 AMP 250 VOLT, 4W, 4P, TWIST LOCK
K1	C-13212E6872-1	STARTER, MOTOR
K2, K4, K5	C-13212E6872-3	STARTER, MOTOR
K3	C-13212E6872-2	STARTER, MOTOR
P1	W-C-596/50-1	CONN, PLUG, ELEC, FEMALE
S1 TO S5	C-13212E6886	SWITCH, PUSH
S6 TO S10	C-13212E6887	SWITCH, PUSH
S11	C-13212E6885	SWITCH, PUSH
S12	R-13220E8931	SWITCH, ALARM, WATER LEVEL
S13	MS24523-22	SWITCH, TOGGLE
T1	C-13212E6829	TRANSFORMER, STEP DOWN
TB1	C-13208E7422	TERMINAL BOARD ASSY
TB2	MIL-T-55164/21 TYPE 17TB4	TERMINAL BOARD
TB3	MIL-T-55164/2 TYPE 36TB6	TERMINAL BOARD
XDS1	C-13212E6861	FIXTURE, LIGHT INDICATING
XF1, 2	MIL-F-21346/3 TYPE FH22BM	FUSE HOLDER

WIRING DIAGRAM
WATER PURIFICATION UNIT - 1500 GPH



LEGEND

REF DESIGNATION	PART NO.	DESCRIPTION
DS4 THRU DS6	C13208E9828	FIXTURE, LIGHTING, CEILING
DS7 THRU DS13	MS35423-1	LIGHT, MARKER, SERVICE, AMBER
DS14 THRU DS20	MS35423-2	LIGHT, MARKER, SERVICE, RED
DS21 THRU DS24	MS35424-1	LIGHT, MARKER, BLACKOUT, AMBER
DS25 THRU DS28	MS35424-2	LIGHT, MARKER, BLACKOUT, RED
JB1, 2, 3, 4, 7	TYPE IV	JUNCTION BOX, 4 GANG, W-J-800
J5	W-C-596/12	125V RECEPTACLE (FRONT WALL)
J6	B13212E1824	24V RECEPTACLE (FRONT WALL)
S18	MS24524-21	SWITCH, TOGGLE (CEILING LIGHTS)
S14 THRU S15	C13214E9044	SWITCH, DOOR
TB4	TYPE 38TB5	TERMINAL BOARD, MIL-T-55164/2
S17	FURNISHED WITH HEATER	SWITCH, THERMOSTATIC, HEATER
TB5, 6, 8, 9, 10	TYPE 38TB2	TERMINAL BOARD, MIL-T-55164/2
TB7	TYPE 38TB4	TERMINAL BOARD, MIL-T-55164/2
TB11, 13	TYPE 38TB6	TERMINAL BOARD, MIL-T-55164/2
TB12	TYPE 38TB8	TERMINAL BOARD, MIL-T-55164/2
JB11, 12	TYPE IV	JUNCTION BOX, 1 GANG, W-J-800
JB3, 6, 8, 9, 10	TYPE IV	JUNCTION BOX, 2 GANG, W-J-800
JB14	TYPE II	JUNCTION BOX, W-C-586
P28	FURNISHED WITH HEATER	POWER PLUG, HEATER
P30	FURNISHED WITH HEATER	THERMOSTATIC SWITCH PLUG, HEATER
P31	FURNISHED WITH HEATER	PUMP PLUG, HEATER
J32	MS3102 R18-10P	RECEPTACLE
B1	FURNISHED WITH HEATER	PUMP, FUEL
TB14	TYPE 38TB7	TERMINAL BOARD, MIL-T-55164/2

WIRING DIAGRAM
1500 GPH VAN BODY

TS 4610-218-34/F.O. 1

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimenter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 38.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimenter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	newton meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN